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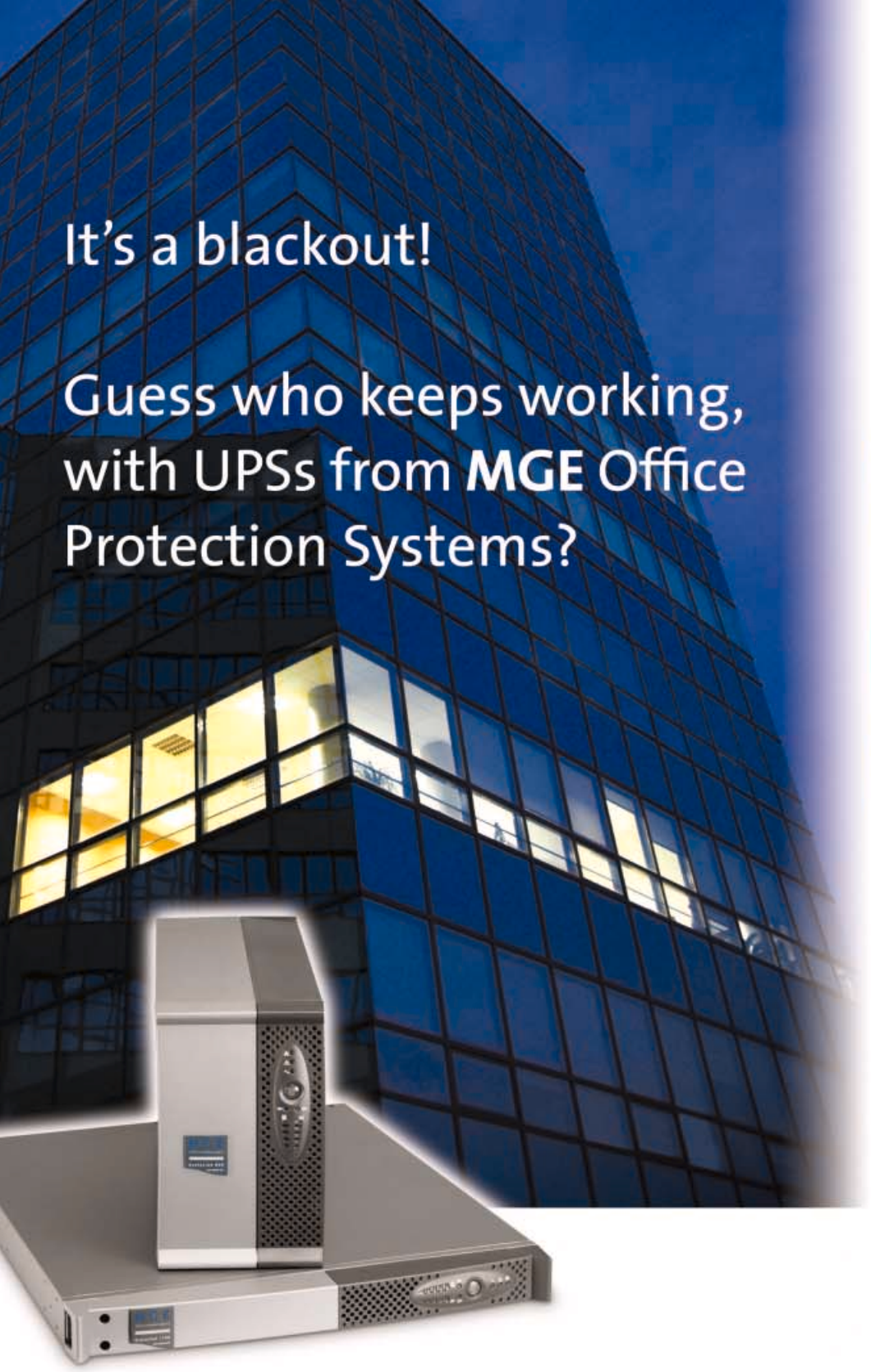

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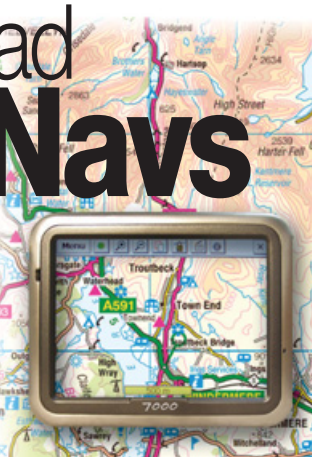

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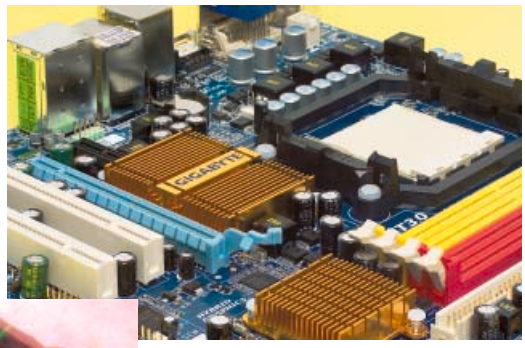

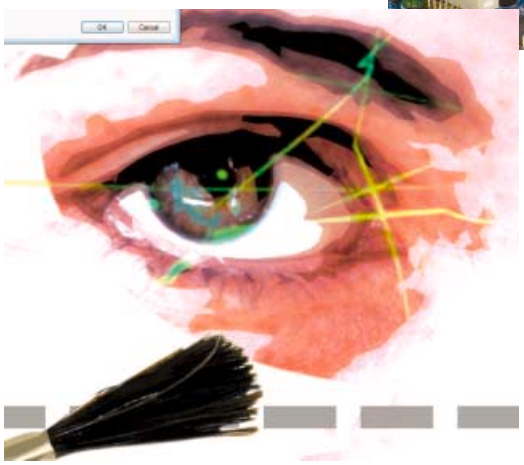

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Editorial

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Broadband crisis point looms

As complaints about slow speeds become commonplace, the broadband infrastructure struggles to keep up with demand

Broadband in the UK has become one of those things that, along with the weather and the price of fish, we Brits just love to have a good moan about. Whether our ISP is slow, unreliable, deaf to our complaints, morally or even financially bankrupt, there's always something to get off our chests.

But as we report this month in one of our regular looks at the state of Britain's broadband services (see page 30), there's no smoke without fire, and it seems that there's definitely something smouldering deep within our internet infrastructure.

We're constantly bombarded with promises of superfast broadband, with cable operator Virgin Media bragging about its 50Mbits/sec pilot and BT going one better with 100Mbits/sec trials in a corner of Kent. But what these headline-grabbing trials hide is that ISPs will soon struggle to cope with demand.

'What the headline-grabbing trials hide is that ISPs will struggle to cope with demand'

In the good old days, most early adopters were happy with their 256Kbits/sec ADSL connections, which seemed like greased lightning compared to a dial-up modem. As one of those ancient fossils myself, I'm still perfectly content to chug along on my 1Mbit/sec service. But as prices plummeted and adoption became widespread, users suddenly found out what 50:1 contention really means. Whereas once they might have been the only user for miles around, now everyone's on their segment and delivered speeds can fluctuate wildly depending on how many people are hogging the connection.

But the problem goes deeper. With the proliferation of bandwidth-hungry video-on-demand services, such as the BBC iPlayer and 4OD, putting real strains on ISPs' bandwidth, something's got to give. Consumers used to cheap broadband won't be enamoured if they suddenly have to start paying the real cost of their bandwidth because they demand guaranteed speeds. A 2Mbits/sec leased line with no contention costs about £4,000 a year. Would you fork that out for the convenience of watching *Eastenders* in high definition?

You'll find many other interesting issues to ponder in our special report, which also looks at the rapidly moving world of mobile broadband. Since we first covered this in our December 2007 issue, mobile operators have fallen over each other to compete with cheaper 3G packages and offers. It looks like a great option, but there are snags, as the businessman who ended up with an £11,000 roaming charge (for downloading an episode of a TV series) discovered.

Vista Service Pack 1 has created waves around the world this month, with people gobbling up internet bandwidth to download it, only to find that it has broken their PC. Make sure you're not one of them by reading our guide to getting and installing it on page 50. We've experienced no problems with SP1 so far but your mileage may vary, as they say. Overall it seems to be a step in the right direction, but don't expect it to work any miracles.

With spring under way and summer just around the corner, it seems a fitting time to turn our attention to the great outdoors. Satellite navigation is one of the few technologies that is still booming in terms of sales, and the number of GPS devices on the market is now enormous. This month we've taken a look at some of the more unusual models that can help you navigate using topographic maps as well as street maps. So if you fancy the idea of getting out a bit more this year, turn to page 87 right now for a bit of inspiration. **PCW**

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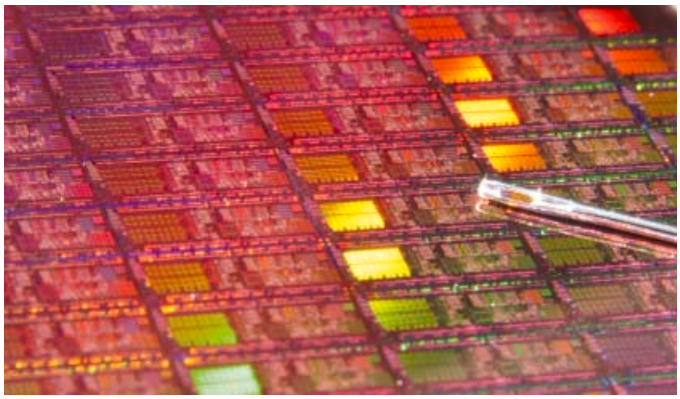
Atoms power pocket mobiles

Intel has launched five low-drain processors designed to power an emerging class of pocketable connected computers.

The Atom processors, codenamed Silverthorne, are Intel's smallest ever at 7.8x3.1mm, and clock between 800MHz and 1.86GHz. They have been designed from the ground up for power efficiency so that even the fastest has a Thermal Design Power (TDP) of just 2.4W (see photo). This compares with a TDP (the heat that a system is designed to dissipate) of 35W for a typical laptop processor.

The Atoms, unveiled at the Intel Developer Forum (IDF) in Shanghai, will be sold with a single chip called the Intel System Controller Hub, which includes 3D, plus 720p and 1080i HD graphics. They are designed for what Intel calls MIDs – mobile internet devices – which hardly constitute a new category as they would embrace Apple's iPhone, the Nokia 8xx series, and indeed any connected PDA or smartphone.

What is new is the computing power of devices of this size and the slightly larger ultramobile PCs. The new chips will also be used in other fanless devices, including in-car entertainment systems.



A needle set against Atom dies on a wafer. The first five Atom chips launched are: Z500 (800MHz, 0.65W, $45); Z510 (1.16GHz, 2W, $45); Z520 (1.33GHz, 2W, $65); Z530 (1.6GHz, 2W, $95); Z540 (1.86GHz, 2.4W, $160). Figures in brackets are clock rates, TDP power and bulk price including controller hub

The launch prices are relatively low, but they are targeting a price-sensitive market.

Before IDF, Intel revealed details of other chips to be released later this year, including those using the Nehalem architecture, which will supersede current Core 2 designs.

One surprise is that the first releases, for home PCs, will have just four cores compared with the six or eight some people had speculated. They will share 8MB of Level 3 cache, with 256KB of Level 2 per core. As expected, they kill off the front-side bus, pulling the memory controller on to the processor – something AMD had introduced five years ago with its Athlon 64.

A new chipset, codenamed Tylersburg, uses a point-to-point link similar to AMD's Hyper Transport and will support DDR3 memory.

Also in the pipeline for the second half of this year is a six-core server processor, codenamed Dunnington, that uses Core 2 architecture. Intel will demonstrate its anticipated Larabee graphics processor later this year. *Clive Akass*

● New AMD Phenoms and more from IDF – see page 9.

ARM 'equal on speed and better on power drain'

Chip designer ARM claims that processors using its cores can match Intel's new Atoms "toe to toe" on performance per megahertz and beat them on power efficiency.

Bob Morris, director of mobile computing, pointed out that ARM cores already drive devices such as Apple's iPhone and Nokia's N800 series. "The iPhone uses an ARM 11 core, running at between 300 and 400MHz. The user experience on that is very good. Products coming out later this year will run our Cortex A8 cores, which have a 2x-3x increase in performance."

ARM also has an A9 architecture supporting multiple cores, but that will take some time to filter through into products. Unlike Intel, ARM sells designs to other companies that pack peripheral functions around its cores to create systems on a chip.

Morris pointed out: "This is not a case of Intel versus ARM. It's Intel versus Samsung, Texas Instruments, Qualcomm and Broadcom – all of which have been making mobile products for years. They have all the radios integrated into chips, which Intel is still working on."

TI's A8-based OMAP 3430 SoC supports 720p HD playback, XGA resolution, 12-megapixel cameras, DVD quality and Imagination Technology's PowerVR SGX graphics. The Atom graphics are on a separate chip.

The biggest difference, said Morris, will be in standby power. Intel cites the Atom as draining a hefty 100MW in standby – and that is just the central processor. "The leakage is the killer," he said. "ARM partners know how to power things down. You can leave your smartphone in your pocket at weekends and pick it up and still have charge."

● How the Beeb helped conquer the world – see page 19.

Microsoft wins standards war

Microsoft has won its battle to have the Office Open XML (OOXML) formats, used in its Office 2007 suite, accepted as a global standard.

The International Standards Organisation's decision, which required a two-thirds majority in a vote by standards bodies from different countries, follows months of vicious wrangling with accusations of rigged votes and other skullduggery.

It means Microsoft can compete for contracts with governments that had pledged to use only open formats endorsed by the ISO. OOXML had already been approved as a standard by the European industry body ECMA.

A preliminary vote late last year went against Microsoft, which then submitted amendments to its specification to answer criticisms from national bodies. The objectors were then asked if they wished to change their vote.

The decision means there are now two ISO document standards. Supporters of the rival Open Document Format claimed OOXML is not truly open because it was not designed by an open process. They also suspect Microsoft will find ways to retain control.

As the final vote began, Marino Marcich, managing director of the ODF Alliance, complained that many critical issues with OOXML, including intellectual property rights, had not been discussed; and a crucial decision about how an OOXML standard would be maintained had been delayed.

The battle has also been a case of corporates trying to gain market edge, with IBM and Sun backing ODF. If OOXML had failed to get endorsement, it could still have ended up as the most-used format, undermining the ISO's authority.

But Microsoft Office is facing tougher competition. The Openoffice.org has just released a new version of its free open-source office suite, which looks superficially like a clone of the old Microsoft Office and saves and reads Microsoft formats.

And Google has announced it is to offer code to allow users of its online Google Docs applications to work offline. Any changes will be automatically synchronised with documents stored online when a user reconnects.

Thousands sign online to keep XP alive

More than 100,000 people worldwide have signed a 'Save XP' petition organised by the US magazine *Infoworld*.

The operating system will no longer be available as a shrink-wrapped product after 30 June, though PC builders will be able to pre-install XP until January.

A starter edition of XP will be available until mid-2010 in emerging markets, according to Microsoft, which claims Vista sales are heading for 100 million.

However, most Vista installs are in machines sold to home users. Business have been slow to adopt, not unusual with a new operating system, and some are concerned about hardware and software compatibility and performance, particularly on older machines.

But not everyone responding to the petition was against Vista. One wrote: "I've had Vista on my laptop since launch and I haven't had any major issues with it."

Robots play the beautiful game at Robocup

This 60cm robot from Germany's Freiburg University will compete this month in a Robocup football tournament with entries from all over Germany.

Each team in the competition at Hannover Messe, organised by Germany's Fraunhofer Institute, comprises four automaton players and a goalie. The robots have to be able to function independently, processing information from their camera 'eyes' in real time. See **http://tinyurl.com/3asf8v** for more details.

A practice session ahead of the Robocup

In brief

Vodafone update

Vodafone announced new mobile broadband prices after our feature starting on page 30 went to press. Monthly charges on contracts of a year or more are £15 capped at 3GB, or £25 capped at 5GB; on a 30-day contract you pay £20 with a 3GB cap. Roaming charges while abroad are £60 and £90 a month respectively, with a 200MB cap.

Web 'addictive'

Web addiction should be added to the list of mental disorders, says to a US doctor. Symptoms include anger, depression and fatigue at computer withdrawal.
→ **www.pcw.co.uk/2212352**

Wimax mobile

Freedom4, the company formerly known as Pipex Wireless, has applied to Ofcom for the right to offer mobile Wimax services. In a joint venture with Intel, the company has already begun a rollout of fixed Wimax services.
→ **www.pcw.co.uk/2212112**

Zetta life

More digital information is created about you than you generate yourself, according to analyst IDC. It reckoned the 'digital universe' contained 281 exabytes, and that by 2011 it will have grown to 1.8 zettabytes – that is 1.8 billion terabytes.

$1bn HD DVD

Toshiba lost an estimated $665.5m (£330m) on its HD DVD business in the year up to 21 March, in addition to $348m it lost on the technology the previous financial year – a total of more than $1bn, according to the US trade magazine *Twice*.
→ **www.pcw.co.uk/2212400**

MyDVD 10

Roxio has released MyDVD 10 Premier, a video-editing and DVD suite for home use. It costs £49.99 from **www.roxio.co.uk.**

In brief

Thought control

A neckband has been developed that allows people with disabilities to talk to a computer without vocalising the words. The Audeo device picks up neural control signals as they head for the vocal cords and interprets them as text.
→ **www.pcw.co.uk/2211937**

O2 Atmos

The latest version of O2's XDA smartphone, called the Atmos, packs the standard mobile keypad and a slide-out Qwerty keyboard. It is powered by Windows Mobile 6.0, enabling real-time email delivery from Exchange servers via quad-band GSM or HSDPA links.
→ **www.o2.co.uk**.

New Toshes

A range of Toshiba laptops will ship in the next few weeks. Business models include the Satellite Pro A300, with a 15in screen, the thin-and-light Satellite Pro U400, and the Satellite Pro P300 with a 17in widescreen display.
→ **www.pcw.co.uk/2212366**

Static fan

US researchers have developed a solid-state fan that moves air by ionising it in an electric field. The fan is said to have three times the flow rate of a small mechanical fan, despite being a quarter of the size.
→ **www.pcw.co.uk/2212374**

Smart trolley

A shopping trolley developed by Microsoft will take you to any item that you ask for in a store. It uses Wifi to locate the trolley and RFID to identify the item.
→ **www.pcw.co.uk/2212257**

Sites paid to install malware

Evidence of how spyware authors and botnet owners pay sites to infect visitors with malware has been uncovered by security specialist Messagelabs.

A site called Installscash gives a price list based on the number of 'installs' on machines and the countries in which they are based. An infected PC in Australia is worth four times one in France.

Prices per thousand installs are listed as: US $50; UK $60; Netherlands $25; France $25, Poland $18, Italy $60, Germany $25, Spain $25, Australia $100, Greece $25, Asia $3.

Sites can be used to enlarge botnets by infecting visitors with Trojans that allow the PCs to be used for Denial-of-Service attacks or sending out spam. Or they can be used to prime botnet for a new task.

Messagelabs senior architect Maksym Schipka explained that infected machines can be instructed to pick up new instructions or code from the host site, obscuring the true origin.

Installscash shows a price list for installing malware

Installscash offers a Russian language version of itself, so it would appear to have originated in Russia. Schipka says such machines are often physically based in countries where it is difficult to have them shut down.

Some of the malware is specifically targeted and designed to evade detection by anti-virus software. A simple line of code can be added to an HTML page to implement a drive-by install of spyware.

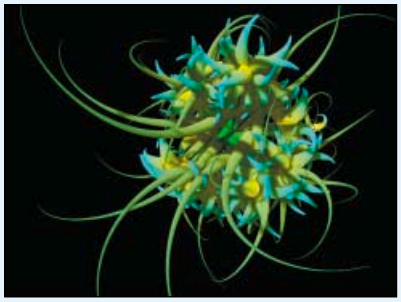
The Annual Global Threat Report from security firm Scansafe reported that malicious code is staying live for longer on websites.

The average was 19 days for the first half of 2007 and 29 per cent in the following six months. The number of 'malicious web events' rose by 61 per cent in the same period.
→ **www.scansafe.com**
→ **www.messagelabs.com**

Virus painting by numbers

Computer viruses can behave much like organic ones in the way that they spread and reproduce. They also look like the living viruses, at least in visualisations by computational artist Alex Dragulescu.

Security specialist Messagelabs recently staged an exhibition of his work in London, called 'Infected Art, Bringing Cyber Threats to Life'. The artist was not there to explain his work but it seems the pictures derived at least in part from various squiggles being assigned to machine-code operations. A sort of painting by numbers, in fact. The one pictured here is supposed to represent the Mydoom virus.



Humyo offers 30GB free online storage

An online service offers 30GB of free storage accessible via a web browser from anywhere in the world.

The Humyo.com service has nearly 90TB of storage in a former Bank of England vault and an intelligent interface that senses the type of device accessing it and uses the appropriate interface.

This means you can access your files from a mobile phone and stream music and video to it.

However, the basic service does not allow you to transfer files directly to a local machine: you have to open them and save them from within an application. 25GB of the storage is restricted to multimedia files.

A £29.99-a-year premium service gives you 100GB, data encryption, and software that sets the storage up as an extra drive on your PC (we hit a small problem with this – see our Test Bed blog at **http://tinyurl.com/2n3jfy**).

The software also automatically backs up your PC and allows real-time online collaboration on a document over the web.

Founder Dan Conlon says 100,000 people had already signed up at the end of a six-month beta phase, despite a lack of publicity.

The site also allows users to share folders with friends or embed a player in emails and on sites such as Facebook and Myspace so people can view your pictures or videos.
→ **www.humyo.com**

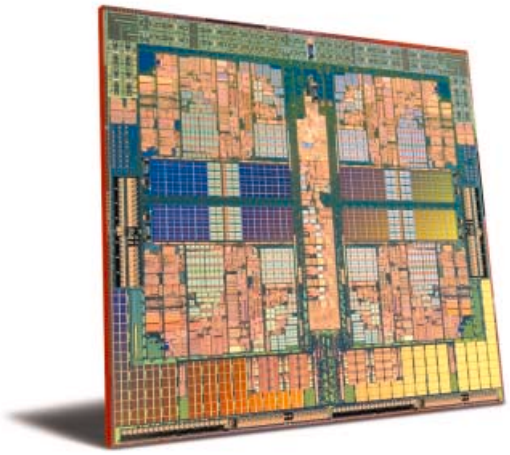
Bug-free Phenom chips arrive

Four AMD Phenom quad-core processors have finally gone on sale after being delayed for months by a bug in the translation lookaside buffer (TLB) used to speed up memory accesses.

AMD senior product manager Ian McNaughton said the bug was one of a number associated with x86 architecture and had been blown out of all proportion. AMD discussed it openly at the Phenom's launch to maintain credibility with server manufacturers.

The new 2.2GHz Phenom 9550, 2.3GHz 9650, 2.4GHz Phenom 9750 and 2.5GHz 9850 cost $209, $215, $215 and $235 respectively.

The latter has an unlocked multiplier so enthusiasts can overclock it. We pushed all four cores stably to 3.1GHz using an Akasa AK-876 air cooler but even at this speed it was outclassed by Intel quad-cores (see review on page 58).



Die shot of the quad-core Phenom. AMD says bug issue was "blown out of proportion"

The conclusion has to be that AMD will have to bring down prices to be able to compete.

Intel plans to release a 1.8GHz energy-efficient version of the Phenom, called the 9100e, with a 65W thermal envelope – compared with the Phenom 9700's 125W and the 9600's 95W.

The triple-core Phenom 8000 series, which are quad-core Phenoms with one dud core, are expected to be available to buy by the time you read this.

Chip giants unite for Flash replacement

A joint venture between two of the world's largest chip firms plans to release a new alternative to Flash memory this year.

Numonyx, formed from the memory units of Intel and STMicroelectronics to commercialise phase-change memory, was created to commercialise Phase Change Memory (PCM), which is said to combine the read speed of NOR Flash and write speed of NAND.

PCM memory also degrades far more slowly than Flash memory and requires no erase cycle.

Phase-change memory works by using tiny heaters to switch cells of chalcogenide glass between a low-resistance crystalline state and an amorphous form with a much higher resistance.

Intel said in February that it had produced PCM cells that store two bits instead on one, which could make the technology price competitive with Flash for purposes such as solid-state disks.

Initial applications are likely to be in mobile phones but the technology is unlikely to go mainstream for at least two years.

→ **www.numonyx.com**

Home-grown smartphones launch

UK mobile handset makers have been scarce since the demise of Sendo after an acrimonious dispute with Microsoft. But Velocity Mobile, based in Tunbridge Wells, has launched two smartphones using Windows Mobile 6.1.

It teamed up with notebook designer Inventec to develop the Velocity 103 and 111. Both back twin cameras for video calls and snapshots, and support HSDPA and GSM/Edge, Wifi, Bluetooth 2.1, and GPS.

The 103, which has a touchscreen, will be out this summer; the 111, with a Qwerty keyboard, will be available this autumn.

→ **www.velocitymobile.com**

Faster frugals draw just 50W

Intel has launched two frugal server quad-cores drawing just 50W, or 12.5W per core. The 45nm Xeon L5420 and L5410 clock 2.5GHz and 2.33GHz respectively and are said to be 25 per cent faster than previous Xeons of their class.

The L5420 will cost $380 (£190) in bulk and the L5410 $320 (£160). Intel plans to ship before July a new dual-core low-voltage 40W processor clocked at 3GHz, with a 6MB cache and a 1,333MHz FSB.

→ **www.pcw.co.uk/2212665**

Intel gives PCs a bit of ESP

A Intel project called Everyday Sensing and Perception (ESP) aims to make computers more human in the way they work.

Andrew Chien, director of the company's corporate technology research unit, told the Intel Developer Forum in Shanghai it would seek ways to make systems "more aware in everyday activities and environments".

He identified four research projects aimed at achieving "90 per cent accuracy for 90 per cent of the day":

- Laugh looks at social interaction. Applications could register sounds, motion and images to assess what a user is doing and suggest related information or provide appropriate music.
- Learn aims to understand interests and motivations to guide and educate users rather than simply channel information.
- Touch aims to bridge the gap between the physical and virtual worlds. Robot computers need to be able recognise and manipulate objects with the correct amount of force and speed.
- Move focuses on location and physical context to improve the ability of GPS and image-recognition systems to provide relevant advice and information.

Chien concluded that, by working closely with other institutions, devices and systems can use high-level semantics to understand and become aware of the world around them and the needs of the user. *Ian Williams*

Wifi Classmate

Intel unveiled a new-look Wifi-enabled Classmate PC at IDF. It is designed to provide schools with a low-cost educational platform.

The company was accused last year of undermining the One Laptop Per Child project to produce $100 laptops for schools in poor countries by offering first-generation Classmate at below-cost price to gain market share. It later joined the project.

Elonex is selling an educational mobile in the UK for just £99.

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Will SP1 boost Vista uptake?

Microsoft will be watching this month to see if the release of its Service Pack 1 package of tweaks and fixes for Vista will boost the number upgrades from XP.

If you run Windows Vista and have configured it for automatic updates (which you can do via the Vista Control Panel) you will probably have been prompted, by the time you read this, on whether or not you want to install the new code.

SP1 will not install automatically if it recognises any incompatible drivers, which Microsoft says are responsible for many problems blamed on the operating system.

But the standalone version, available for download from the Microsoft Update site, will install whether it likes your drivers or not. Microsoft has posted a short list of programs known to have problems with SP1 – see **www.pcw.co.uk/2212324** for the link.

A release on this scale is bound to hit problems on some machines, but relatively few complaints have been recorded on the web. Neither has there been much enthusiasm expressed, however, because there is little new in the upgrade.

You may notice a slight speed-up on some operations after you have used the system a few times, allowing a while for SP1 to retune its Superfetch technology, which anticipates what data or code you need and preloads it.

Companies tend to take the SP1 release of a new operating system as a sign of maturity and a signal to upgrade. Figures show Vista trailing XP in businesses.

A survey by open-source content management system provider Alfresco Software indicated that 63 per cent of business users were still using XP and just two per cent used Vista. Marketing director Nikki Tyson said the survey covered 35,000 people, mostly from Europe and the US, inquiring about its software in the year up to February.

"The figures might be skewed slightly by the fact that these were people interested in open source, but it is a large sample so it is still significant," she said.

• Vista's aid package – page 50

Mozilla slams Safari updates

The Mozilla Corporation has criticised Apple for spreading its Safari web browser through its software update service, normally used to patch applications that have already been installed.

Mozilla chief executive John Lilly described it in a blog as misuse of the service.

"It undermines the trust relationship great companies have with their customers, and that is bad not just for Apple but for the security of the whole web."

He argued that the practice might lead users to ignore future security patches.

The new version, Safari 3.1, includes support for video and audiotags in HTML5 and the use of CSS animations and web fonts. Apple claims it loads pages up to 1.9 times faster than Internet Explorer 7 and up to 1.7 times faster than Firefox 2.

It is available as a free download for Windows or Apple Macs from **www.apple.com**. Mozilla has released a fourth beta of its Firefox 3.0 at **http://tinyurl.com/36wvtz**.

BBC plugs iPlayer hole

The BBC has plugged a hole in its iPlayer software for iPhones or iPods that allowed hackers to use a Firefox plug-in to bypass digital rights management to save programmes with no timeouts or copy restrictions.

iPlayer programmes are usually viewable for only a week after they are first broadcast.

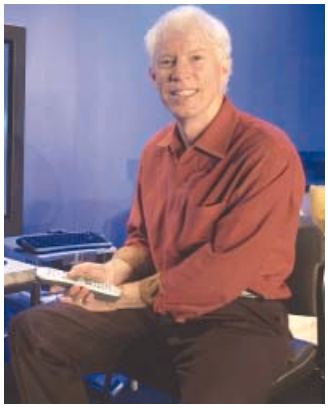
'Vista Capable' appeal backfires

A number of embarrassing internal Microsoft emails have been made public as a result of class-action claiming machines were wrongly labelled 'Vista Capable' when they could run only a "hobbled" version of the operating system.

A Microsoft appeal against a decision to grant the case class-action status backfired when the judge unsealed the cache of emails.

The New York Times reported that Microsoft marketers used the term Vista Capable believing it avoided the implication that the machine would necessarily run all versions of Vista.

The paper also stated that Microsoft set a low threshold on Vista Capable specs to avoid blighting sales of entry-level XP PCs.



The decision met considerable internal protest, the paper said.

Allchin: 'We botched this'

"Even a piece of junk will qualify," wrote Microsoft program manager Anantha Kancherla in an email.

After the Vista release Mike Nash, vice-president of Windows product management, wrote that his laptop had been reduced to a '$2,100 email machine' that would run only a hobbled version of Vista, and could not cope with his favourite video-editing program.

The emails also contain complaints by Microsoft high-ups about a lack of Vista drivers shortly after the release of the OS. Microsoft says the number of Vista drivers has doubled since then.

The Vista Capable issue mirrors almost exactly a furore when Windows 95 was release 13 years ago. Microsoft claimed it would run in 4MB of Ram, the usual total in PCs at the time. In fact, for a usable performance, they required a costly upgrade to 16MB.

Jim Allchin, then co-president of Microsoft's Platforms and Services Division, wrote in another email: "We really botched this. You guys have to do a better job with our customers."

Novell rattles another skeleton

Another skeleton rattled in Microsoft cupboards when the US Supreme Court denied its request to drop an anti-trust suit filed by Novell in 1994 alleging anti-competitive behaviour.

The case relates to when Novell owned Wordperfect, once the world's best-selling word processor. Microsoft is accused of squeezing Wordperfect out of the market by giving discounts to PC builders to bundle Word with their PCs. Novell is under fire for cosying up to Microsoft to reconcile the competing ODF and OpenXML formats.

• Test Bed comment – see **http://tinyurl.com/2ogzzh**

3.5G High-Speed Data

DrayTek now provides optional support for GPRS and HSDPA cellular connections, now available from most UK cellular operators at up to 1.8Mb/s. This means that you can get broadband speeds without needing a fixed line, ideal for mobile working, temporary locations or backup to your main broadband feed.

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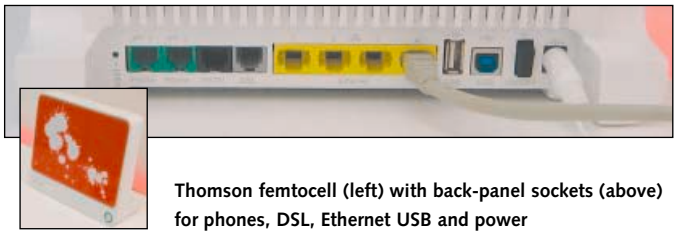
Femtocell packs Wifi router

A femtocell home cellular base station from Thomson integrates a DSL modem, a Wifi access point and four-port Ethernet router.

The company expects mobile phone providers to bundle the device with ADSL broadband access and two handsets by the end of the year.

Femtocells improve cellular coverage within homes but offer even more benefit to operators because they make more efficient use of expensive spectrum and reduce the 'backhaul' traffic from base stations to truck routes. So femtocells are likely to pack extra features to encourage adoption.

It makes sense for mobile operators to bundle them with broadband to simplify charging as the user's own landline is used for the backhaul.



Thomson femtocell (left) with back-panel sockets (above) for phones, DSL, Ethernet USB and power

The TG870 femtocell will cost a little more than £150 unsubsidised but the price is expected to hit around £70 as production ramps up, Thomson business development manager Jeff Land said at Cebit.

The TG870 supports 3.6Mbits/sec HSDPA and 802.11g Wifi. Next-generation femtocells shown at Mobile World Congress last month supported both Wimax and 100Mbits/sec 4G Long Term Evolution (LTE) links. The 100Mbits would be shared with other users over a neighbourhood base station but home femtocell users could have it to themselves.

Another selling point is that femtocells offer similar home coverage to Wifi but use only a tenth of the power needed for transmission, reassuring those who give credence to claims that the radiation is dangerous. *Emil Larsen*

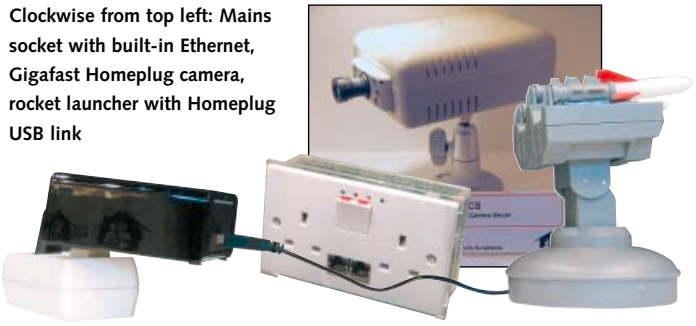
Homeplug devices go like a rocket

Dozens of companies showed data-over-mains devices at Cebit, but the most striking was an Intellon prototype packing an Ethernet port into a standard power socket (see picture).

The company says it is already talking to a UK builder to get the device fitted into new homes. Sadly, you can't fit them into your own house unless you're a certified electrician, or you could fall foul of UK Building Regulations.

A number of media streamers and set top boxes are packing the technology so they are networked simply by plugging them in.

Gigafast showed a Homeplug security camera and an Homeplug adapter that acts as a remote USB port, which on the stand was connected to a computer-controlled rocket launcher (see picture).



Clockwise from top left: Mains socket with built-in Ethernet, Gigafast Homeplug camera, rocket launcher with Homeplug USB link

Nearly every manufacturer showed off AC-DC adapters packing an Ethernet port, allowing manufacturers to enable notebooks and other devices for Homeplug without internal modification. The devices got the name 'Y cables' because when in use they have a single mains wire going in and a DC line and an Ethernet cable coming out.

A downside is that the adapters can power only up to 30W because any more creates too much noise for Homeplug to operate.

Market leader Devolo showed off next-generation Homeplug rated at 400Mbits/sec but with real-life throughout of around 180Mbits/sec – a speed achieved by using current Homeplug carrier frequencies for 100Mbits/sec and higher frequencies for the remainder. *Emil Larsen*

Translation a snap for phones

Linguatec showed a product called Shoot and Translate that allows travellers to translate foreign signs, menus and other text by snapping them with a Java-enabled cameraphone.

The €49 (£40) software translates German, French, Italian, Portuguese, Spanish and Chinese to English, and vice-verse. It also translates French and German both ways.

The phone needs a resolution of at least two megapixels for the optical character recognition to work. For more information, log on to **www.linguatec.net**.

In brief

WHS delays

Medion said it was withholding its Windows Home Server product because of a bug that in rare circumstances can corrupt data. Iomega said it had also delayed a WHS launch because of concerns about demand and profitability.

But Belinea and Fujitsu-Siemens both showed WHS products – the latter a rather ugly box from Intel that looks twice the size of its rivals. Belinea showed a refreshing orange and white model.

Cheaper 3D

German research organisation Fraunhofer showed a 3D LCD monitor that doesn't require special glasses.

It uses a TFT display overlaid with a corrugated glass panel that sends a different set of pixels to each eye. Software adjusts the two images to suit your position, as tracked by a webcam.

The system can be made more cheaply than earlier designs as it doesn't need an expensive lens.

NVidia speed

Gainward and Inno3D showed graphics cards, based on Nvidia's Geforce 9800GX2, which uses two 65nm G92 chips like those powering the company's single-processor 8800GT and 8800GTS. If the performance of two 8800GTs is anything to go by, the 9800GX2 could end up being the fastest card in existence.

Both new 9800GX2 cards are huge and have an HDMI socket to facilitate gaming on large-screen TVs.

1Kw power unit

Corsair says its 1Kw power supply will be the first to get Nvidia's stamp of approval for use with triple-SLI graphics cards. The HX1000W is essentially two 500w supplies in one box that Corsair says can supply full power at 50°C.

Prepare to meet thy doom

Scientists call for better computer modelling of the local effects of climate change – and a strategy for adapting to them. Clive Akass reports

Climate-change scientists called this month for massive investment to improve computer modelling of the effects of global warming. There were also calls at a climate symposium at the Royal Society in London for greater co-operation between the various specialists involved, including computer modelling experts.

The symposium managed to be both reassuring (for people living well inland in Britain) and terrifying. The fear that Britain will freeze from a flipping of the Gulf Stream has receded; it is now thought that there will be a slowing of the great flow of warming water from the tropics but the loss of heat will be more than offset by the warming caused by greenhouse gases.

Chart after chart at the symposium showed that climate change is both normal and scary. Ice sheets reached down to London's Finchley Road just 200 lifetimes ago; 100 lifetimes ago you could walk from Britain to the continent. As one speaker said: "Anything that has happened in the past can happen again."

The question that exercised the scientists was the extent to which you can use past fluctuations to build computer models to predict future changes – and how you then persuade people to believe those models, especially when they are riddled with uncertainties.

You can read the past to see what the world looked like under different climatic conditions. You can test your computer models to see how well they can fit historical records. But, as several speakers pointed out, your models can only take you so far because what is happening now is unprecedented.

The one certainty, for all but a small minority of scientists, is that human activity is causing the world to warm up. What is not known for sure is how quickly this will happen, and what the effects will be.

The complexities are daunting. To take two variables: global temperature and the level of carbon dioxide in the atmosphere. The relationship between these is generally depicted as a simple case of the more the CO_2, the hotter the earth. But Professor Peter Cox of the University of Exeter pointed out: "The climate is sensitive to CO_2 but CO_2 is more sensitive to climate."

Higher temperatures affect the growth of CO_2-absorbing plants and the absorption of CO_2 in the oceans, with the result that rises in temperature historically tend to come some time after CO_2 levels increase. This fact was seized upon by a recent Channel 4 documentary to dismiss global warming claims as a "swindle" (see below).

For scientists it is another complex feedback mechanism to fit into their models. Humans are of course disturbing its damping effect by releasing CO_2 trapped for millennia as oil, a natural form of carbon sequestration.

Desperately in need of better modelling is the melting of ice, both at the poles and in more southerly upland glaciers that act like a reservoir for water supplies in places like northern India, the symposium was told.

The effect of ice and ocean warming on future sea levels has produced an alarming range of predictions. Professor Gerard Roe, of the University of Washington, said he had recently been to a workshop of experts, none of whom "was prepared to rule out the possibility of [a rise of] metres in a century".

A rise of just one metre would put much of East Anglia, Holland, and the north German coast below sea level and displace millions of people in places including Bangladesh (see **http://flood.firetree.net**).

Local impacts such as these need more study and better forecasts. Professor Bob Watson, chief scientific adviser to the Department of Environment, Food and Rural Affairs, called for "high-resolution, probabilistic models".

He agreed that this would require multi-petaflops of computing power that might need to be financed at a European level.

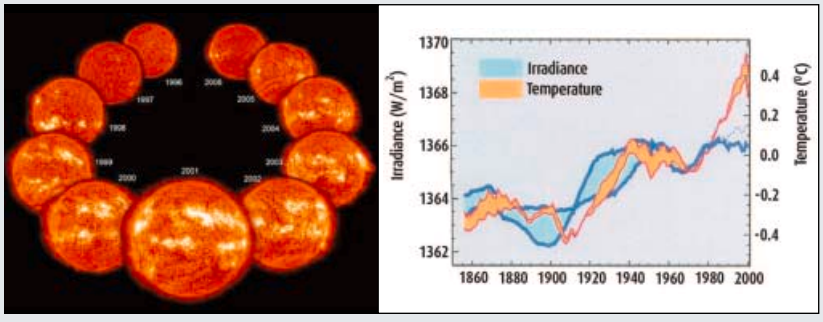
He stressed that there was no point in predicting the impact of climate change without also developing a strategy for adapting to it, and that the issue should not be divorced from others such as bio-diversity and pollution.

Scientist hits back at global warming 'swindle' documentary

The relationship between CO_2 levels and temperature (see above) was not the only issue over which the Channel 4 documentary The Great Global Warming Swindle came under fire. One scientist went so far as to accuse it of lying.

The programme ascribed rising global temperatures to fluctuations in solar energy reaching the earth, or solar irradiance. This fluctuates over an 11-year cycle (see picture), with larger variations over the centuries, and is one of many variables that must be fed into climate models.

Even looked at in isolation, the figures are not reassuring. The graph on the right shows global temperature since 1980 has risen sharply while solar radiation has remained relatively flat.



Left: Composite Nasa picture of the sun over 11 years, showing variations in radiation
Right: Global temperature has risen dramatically compared to solar radiation

The programme cited the fallibility of computer models as grounds for scepticism. Yet, as with all weather forecasts, the fact that they can be wrong doesn't mean they cannot say some things for sure. And the argument cuts both ways: the models could be underestimating the problem.

The possibility exists that we could trigger a thermal runaway that destroys all life on earth. But happily that is not considered at all likely.

Professor Martin Visbeck, of Keil University, told me: "We are far more likely to be destroyed in the next 300 or 400 years by a new disease sweeping across the world."

How the Beeb helped conquer the world

There are now more ARM processors in use than there are people on the planet – and all thanks to the old BBC Micro. Clive Akass attends a reunion of the design team

The designers of the venerable BBC Micro computer recalled this month how it led to the development of one of the world's two dominant processor architectures.

Sophie Wilson and Steve Furber were Cambridge graduates working for a local start-up called Acorn in the early 1980s when the BBC launched its Computer Literacy Project, one of the most successful mass-education exercises ever.

Acorn was one of seven companies asked to submit designs for a machine that would provide a standard platform for a series of TV teach-ins on computing. Wilson and Furber put together a prototype in just five days and it won the contract.

The Beeb, as it became known, came at an extraordinary time, when the Great British Public was beginning to realise that almost anyone could afford a computer and learn to use it. Even so, the BBC was astonished by the response to its programmes.

One in six of the population, men and women of all ages, viewed at least one of them; and sales of the BBC Micro, predicted to be around 12,000, eventually reached 1.5 million.

There was, according to John Radcliffe, executive producer of the literacy project, a lot of anxiety among viewers about whether they would be able to cope. "And the older people feared they would be outclassed by the younger ones," he told a reunion at London's Science Museum of BBC and Acorn people involved.

It used a six-year-old processor, the MOS 6502, and the first model had just 16KB of Ram. But it had lots of stuff proto-geeks could get into: a well-structured Basic language and ports capable of networking, controlling add-ons, downloading software from the TV via a Teletext adapter and even linking in a co-processor.

To keep the price down it used a TV as a monitor, connecting via the aerial socket using a design Furber adapted from one he found in Wireless World magazine.

Gold-plated BBC Micro presented as a competition prize. Above: Steve Furber

The greatest immediate impact on Acorn was psychological, said Furber. "The engineers became very confident that the things that they did would work."

They soon began to look round for a processor to power a successor to the Micro. "We looked at the 16-bit processors that were around at the time, the Motorola 68000 and the National Semiconductor 32016 and we didn't like what we found.

"These were very complex processors based on mini-computer architectures and they took a very long time to do some things. In particular they had a very poor interrupt latency, so that every time you wanted them to do something different it took them a long time to stop what they were doing and pay attention to what you wanted them to do."

Acorn had taken on some chip designers and did not know quite what to do with them. A decision followed a trip Wilson and Furber took to the Western Design Center at Phoenix, Arizona, where the successor to the MOS 6502 was being drawn up.

"We expected to find big shiny American buildings full of big computers. What we found were a bunch of people working in a bungalow using Apple 11s and employing high-school kids over the summer to do circuit design. We came away saying that if they could design a processor, then so could we."

Furber drew up a reference model, a kind of design template, for a new processor in 808 lines of BBC Basic code; and Wilson, now chief architect at Broadcom, worked on the instruction set. The project was kept secret in case nothing came of it. "Eighteen months later we found ourselves with a working, rather effective ARM [then standing for Acorn RISC Machine] chip. It was the 26th of April 1985," Furber said.

"When we decided to make it public I had the strange experience of ringing up journalists and saying 'We've made a new processor.' And them saying: 'We don't believe you.' And hanging up."

The first ARM was used as a co-processor for the BBC Micro. The next version, the ARM2, powered the fabled Archimedes desktop computer. But Acorn, unlike Apple in the US, never had a home market big enough to allow it to withstand the dominance of Wintel machines, despite having technology that was in many ways superior, and the company was bought by Olivetti in 1985.

However, the 32-bit ARM architecture had two things going for it. Its reduced instruction set meant it had fewer hard-wired functions, a lower transistor count, and a smaller footprint than Intel chips. And it was designed to run cool to avoid the expense of fans in the price-sensitive educational market targeted by Acorn.

"That was serendipitous," said Furber, ICL Professor of Computer Engineering at Manchester University. "We had to keep the power consumption below 1W. The [chip] design tools were not very good at the time and when we got the chip in it turned out to be drawing only a tenth of that."

The result was that Apple used ARM chips in its ground-breaking 1993 Newton handheld. The machine was a flop, but it opened doors for Advanced Risc Machines, spun off from Acorn in 1990 to develop the ARM processor.

Two other trends buoyed up the company: the emergence of mobile phones, and the increasing use of systems-on-a-chip (SoCs) – packing all the modules for one application around a central processing core on a single piece of silicon.

ARM's business is now built around providing core designs for other companies to use in SoCs. The number of devices using ARM cores exceeded 10 billion in January – more than one for each person on earth and far outnumbering x86 processors.

"It would not have happened without the BBC Micro," said Furber. "Without that success we would not have had the confidence to design a microprocessor."

● There will be an exhibition dedicated to the BBC Micro at the Science Museum in 2009.

INTERACTIVE

LETTERS

Send your letters to The Editor, *PCW*, Incisive Media, 32-34 Broadwick Street, London, W1A 2HG **Send your email to** letters@pcw.co.uk

LETTER OF THE MONTH

Forget 3D gaming

Released in September 1984, the text-based Hitchhiker's Guide was an instant hit

Your otherwise fine nostalgia-fest feature, History of PC Games (*PCW* April 2008), barely mentioned the text games that were so popular in the early 1980s. Back in the days when graphics cards were unknown, Ram was 640KB, operating systems and applications were loaded by floppy disk, the internet barely existed outside the military and monitors were monochrome and text-only.

In 1990, when I was working for a metropolitan authority that shall remain nameless, the playing of text games, particularly Zork and the Hitchhiker's Guide to the Galaxy, was endemic among us grunt workers to counter the sheer bureaucratic ennui of our daily existence.

They were gripping, required us to use our imaginations, and were often fiendishly difficult – I still remember with pride being one of only three people to finish Hitchhiker's Guide after what must have been hundreds of hours of play over a year.

Their best advantage, though, was that because they were text our bosses thought we were beavering away at word processing or data entry, a luxury that modern cubefarm drones no longer have in the days of high-quality 3D graphics.

I mourn the demise of text games which, like a good book compared with a multimillion-dollar film, require you to use your imagination rather than bludgeoning your senses with whizz-bang special effects. They also ran on the lowest spec PCs, required no graphics cards, needed no motor skills other than typing, and you could learn how to play them in minutes.

I hope that, one day, gamers will return to the technical simplicity but narrative complexity of text games, and that new titles will be produced by writers with imagination. And if this ever happens, I hope and pray that a sequel to Hitchhiker's Guide is one of the first to emerge.

Fred Riley

THE HISTORY OF PCW

Congratulations and thanks on the first-class 30th anniversary issue of *PCW*. It looked absolutely great. Here are a few more facts on the early issues of *PCW*, which it seems are vague to many people. The first issue was published (available in the shops) on 8 February 1978.

This issue was not dated (just issue 1, volume 1) as I was not sure there would be a second issue – firstly because computer experts at that time thought it was too early for a PC magazine, and secondly I had very little money, no office and no permanent staff. In fact, our so-called office was a table at the Troubadour Cafe on Old Brompton Road, London SW5, with a convenient telephone kiosk located just outside.

The editor, Meyer Solomon, lived round the corner and was working part-time in the cafe, and the magazine address was listed as the newsagents above where I was living at the time.

What prompted me to publish the magazine was that I was

It all started here

IN THIS SECTION

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29 Guy Kewney

always interested in new technology and had read a considerable amount about it (free newspapers and magazines from my shop!)

In mid 1977, US newspaper *The Wall Street Journal* published an article on small computers, which fascinated me. I researched a bit more by getting *Byte* and *Kilobaud* magazines from the US.

The first issue was a sell-out and we received about 3,000 subscribers, which ensured there would be more issues of *PCW*.

Angelo Zgorelec (*PCW* founder)

PERSONAL TOUR OF BLETCHLEY PARK

In reply to Rod Theobald (*PCW* May 2008, Letters), I used to be the chairman of the Elliott 803 Users' Group and I'd like to extend an invitation to all *PCW* readers to visit Bletchley Park's newly opened National Museum of Computing (**www.tnmoc.co.uk**).

If *PCW* readers would like to contact me, I'd be most honoured to give them a personal tour around the museum and the Colossus rebuild.

To arrange a tour, please email me on **pcw@clock-tower.com**.

Sheridan Williams

THREE CHEERS FOR THE ADA

In the news article 'German beats wartime Colossus on Nazi decrypt' (*PCW*, April 2008), you describe how Joachim Schueth recently used his laptop to beat the replica Colossus at Bletchley Park – I suspect living nearer to the transmitter helped him too.

On the same page, you also mention Ada Lovelace, so it is rather odd that you didn't mention the connection between them. Joachim used the Ada programming language to process the radio signals and to simulate the behaviour of Colossus. How refreshing it is to see someone choosing to write programs in Ada, whether it is for the sheer fun of it or because they want confidence that their programs will not let them down on the day. Well done Joachim and Ada!

Terry Froggatt

PRICE AND PRACTICALITY

It's not just me (a 50-year-old ex-Z88 and Acorn Risc PC user), but also my wife (a 42-year-old late adopter of home computing), who would like an Asus Eee PC and a Wii. However, while most people seem to have understood what is good about a Wii they don't seem to have grasped the essential about the Eee PC, and, with its recent announcement of a new version, I fear this could include Asus.

The issues for me, and lots of others, are price and practicality. If you want a laptop for email and a bit of word processing, then there is a world of difference between £220 and £340 in the justification stakes.

You just cannot compare a £1,000 Apple Macbook Air with an Eee PC any more than you can compare a Ford Ka with a Ferrari. However, the Eee PC is not just a cheap laptop, it is small enough to take in your luggage – not as your luggage. For many, this is a very practical point.

I also think Asus missed a trick with the soldered Flash memory. If it had put a second SDHC port inside and fitted it with a fast card, then it could have made one model but shipped whatever was in demand. But what do I know? I can't even find one in stock at the right price.

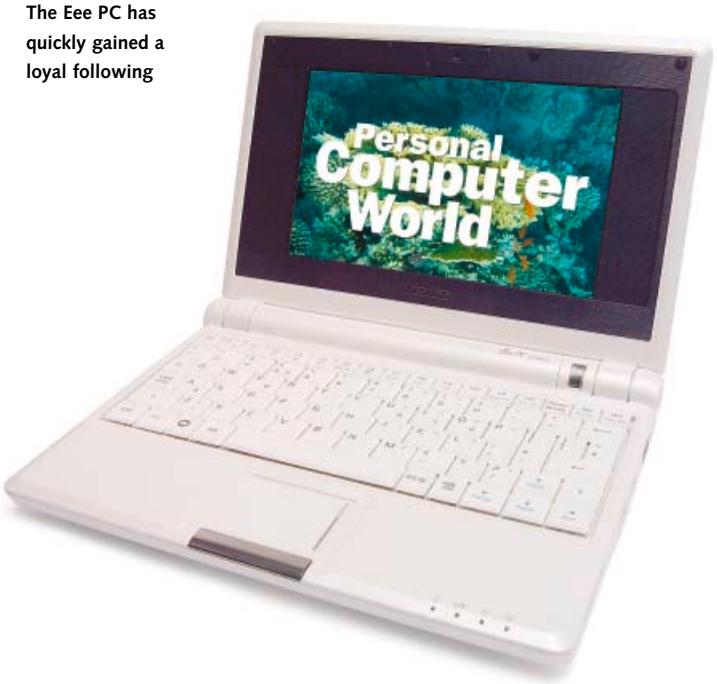
Mark Foweraker

PSION OF THE TIMES

I loved your April issue – all very nostalgic! When my young lad (now some 32 years old and with one-and-a-half PhDs under his belt) first came home from his primary school talking about computers, I resolved to keep ahead of him.

Inevitably, a Sinclair ZX81 came along, soon followed by a ZX Spectrum and then a BBC Micro with all the bits.

Throughout this learning curve, I discovered Psion and have had virtually every model since the very first 'push/pull' grey device. I used these various Psion offerings throughout my healthcare career as I had a need for truly portable, instant-access information.



The Eee PC has quickly gained a loyal following

Now, as a professional photographer, I have learned to absorb the digital age and Photoshop and still believe I am keeping ahead of my son – especially when it comes to imaging and spreadsheets.

I thoroughly enjoyed your 30th anniversary issue and will keep it safe as a reminder of how far we have come.

Incidentally, I recently enjoyed an exhibition of the historic development of computers at the top of La Grande Arche in La Defence, Paris, where they displayed examples of the earliest computers.

Today, although I use a variety of PCs in my daily business, I still rely totally on a Psion 3MX for all my personal matters and immediately-to-hand information. It has been 100 per cent reliable, despite three serious drops.

Switching between three agendas, 14 spreadsheets, five databases and three Word documents, it has never been beaten in terms of speed of access. Other software (Berlitz, Phrase, Wine, Dietary Analysis etc)

CLARIFICATIONS & AMPLIFICATIONS

● HP CM1015

The price HP quoted for HP's CM1015 in our Colour Laser MFD group test (April 2008) was incorrect. The correct price is £299. As a result, the product's Great Value award has been rescinded.

● Solwise Homeplug AV

In our Solwise Homeplug AV review (April 2008), we incorrectly stated transfer speeds in Mbytes/sec instead of Mbits/sec.

● What's on your desk? (March 2008)

In the Business feature about virtualisation, a misplaced full stop implied that Parallels had acquired Softgrid. In fact, Microsoft acquired Softgrid and thereby achieved a presence in the application development arena for virtualisation.

In the same feature we misspelled the name of Clearcube's product Sentral.

↘

Psion's 3MX was a popular and reliable personal organiser

simply adds to the versatility of this serious previous world-beater – and it was British-designed and made! An absolutely brilliant device – where next? Perhaps the nearest device is the latest Nokia Communicator?
Keith Erskine

IN THE FRAME

I found your digital photo frame group test (*PCW*, April 2008) very interesting, but your article missed two key points. I have one of these picture frames, which is similar to the featured Cenomax, but without the remote control.

It works well and is very satisfactory when viewed from a distance of one metre or greater. I reduce my photos in Paint Shop Pro to the optimum size of 480x234 – some of my albums contain hundreds of photos, so I do them in batches of around 20. Then I put the reduced-size photo album on to a 256MB SD card and run the photo frame.

The frame ignores the alphabetical or numerical sequencing, instead playing them back by what appears to be each photo's time stamp, thus throwing my holiday photos out of sequence. It also treats the albums in the same way.

I tried renaming the photos within the albums after reducing the size, but it made no difference.

Based on the fact that I should be able to get approximately 7,000 resized photos on to a 256MB SD card, another problem comes to light: if I switch the unit off overnight, it restarts at what it thinks is the first album again.

The chances of getting through 7,000 photos in one day is limited, so I am unlikely to see the most recent additions to the Photo Frame shown unless I leave it on permanently going through its slideshow.
Ron Hak

*Will Stapley replies: In answer to your first point, you could try editing each photo's Exif data (the frame may be using the Exif time stamp to order your photos). There are plenty of free Exif editors around – try the Quick Exif Editor (***http://tiny url.com/37l25p***). As for your second point, you may be better off having a selection of SD cards that you simply swap over every week or so.*

A SHORT HISTORY OF COMPUTING

From 'Pacman to Pentium' (*PCW*, April 2008) was excellent reading and brought back many memories: I had completely forgotten about The Last One.

I appreciate that the article was not intended to be a complete history of computing, but I was a little disappointed that two of my machines were not represented – one was the Ohio Scientific Challenger 1P. Here's to the next 30 years.
Ivan Drake

UPGRADE ISSUES

Over the decades, I have regularly upgraded Windows and now Vista. The process has usually required some new hardware and sometimes I have run two machines during the transition to the new operating system – the old machine is then quickly pensioned off. But a year on this doesn't seem possible with Vista.

I am not unhappy with it – Photoshop, music and video editing are faster on the 64-bit version with 4GB of memory, and I like the new interface.

Initially, there were problems with Nvidia Ntunes and finding a wireless adapter that supported Vista 64, but these got sorted and eventually drivers came along for my Creative MP3 player, DVB-T USB dongle and other equipment. I needed a new webcam and still need a new modem, but many components are still not listed as Vista compatible.

We can now attach countless peripherals to PCs – printers and scanners, cameras, graphics tablets, DVD recorders and even devices such as microscopes, all of which need to be supported when you upgrade or repace.

My problems are with the Mustek A3 scanner and dedicated Acer slide scanner, neither of which work with Vista and are expensive to replace.

I also use my PC to test equipment and software from clients as many are still running old systems, sometimes with serial interfaces, that Vista does not support. I can overcome some compatibility issues by using Virtual PC to run XP or earlier versions, but the lack of USB support limits this. With Vista, it looks as if I'll need to run two PCs for several years to come.
Andy Scott

WIN **Next month's prize for the letter of the month is a Sapphire Radeon HD 3850**

Sapphire's Radeon HD 3850 is designed for ultimate DirectX 10.1 HD gaming. Despite having over 400gigaflops of computing power, the 3850 has break-through power efficiency, thanks to the improved 55nm manufacturing process. The Radeon HD 3850 has 320 stream processors, a core clock of 668MHz and 512MB of GDDR3 memory running at 828MHz, so it will chew through all today's games without breaking a sweat. A dedicated hardware decoder takes care of Blu-ray film playback while your CPU is left free to do other tasks. Sapphire includes an HDMI dongle with all its cards so you can hook your PC up to a big TV and enjoy 5.1 surround-sound output.

Digital photo frames are a great way to show off your snaps, but they're not perfect

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Marketing nobbled my notebook

If your new computer doesn't seem a quick as you'd hoped you may need to give it a spring clean before blaming the hardware

I recently bought myself a Sony Vaio TZ-series laptop and was amazed at how a single product could result in such contrasting experiences. Physically it's everything I want from an ultraportable notebook: thin, light and sleek, with a superb screen and usable keyboard. To see it is to love it. But after powering up, the TZ could try the patience of a saint. Out of the box, its performance, frankly, sucks.

On the surface the problem appears to be a resource-hungry OS running on under-powered hardware. Windows Vista certainly has a bad reputation, with many frustrated laptop owners campaigning for Windows XP drivers to be made available for those who wish to make the switch to something less demanding. Sony relented and, if you're interested, there are XP drivers for the TZ series on several of its websites.

'Firing up Vista's Programs and Features Control Panel listed a considerable 96 items'

But however much I've knocked Vista for its demanding nature and extolled the virtue of a nice, clean XP installation, something just didn't ring true. The Vaio TZ may not be the world's fastest notebook, but its hardware configuration is hardly poor. Even the cheapest model is equipped with a 1.06GHz Core 2 Duo processor and 1GB of Ram. Sure you can argue that Vista prefers 2GB and something quicker, but the TZ's core specification should be able to run Microsoft's latest OS just fine. So what's the real problem?

One word: junk. It's been a long time since I've tested a retail PC bought directly from a store. I admit my notebook was bought in the US, but as it struggled to start up I was shocked by the amount of pre-installed junk. Junk masquerading as valuable enhancements had turned a perfectly usable laptop into what appeared to be a woefully under-powered system.

The warning signs were plain to see on its desktop with no fewer than 10 shortcuts to promote various offers. Sony's infamous for self-promotion, but surely preloading both the *Spiderman 1* and *2* movies on a new notebook with a shortcut to 'unlock' them for a fee is a bit rich. Besides, if Sony saw it as an entertainment laptop, why install Vista Business?

My Vaio also had AOL and Sprint Wireless trials, a Microsoft Office tryout, and my personal bugbear, two months worth of Norton Internet Security – just long enough for most owners to become reliant and feel obliged to make a purchase when it expires. Then there was Corel Paint Shop Pro, Corel Snapfire, Napster and more besides. Firing up Vista's Programs and Features Control Panel listed a considerable 96 items. Remember this was a machine that had just been switched on for the very first time.

It took more than six minutes before the Vaio was ready to use, and a minute and a half to shut down. All this software is pre-installed to give the impression of value, but most of it is little more than trials and adverts. How much do manufacturers get paid to pre-install these trials?

No wonder so many Vaio TZ owners have been vocal on forums about their disappointment, either returning them as unusable or taking the considerable effort to install XP instead. But Vista or modest hardware wasn't the problem. Over-zealous marketing was.

While I was tempted to wipe my Vaio clean and start from scratch, I uninstalled the trials and unwanted programs, then reduced the startup items from a whopping 26 to eight essentials. This reduced the startup time to a minute and a half.

This was now the machine I'd ordered and one I was satisfied with – it even felt pretty quick. But I wonder about others who buy a computer and just accept its performance out the box. Maybe my US-based Vaio was a particularly bad offender, but trials and unnecessary startup items plague most new retail computers.

So if your new computer doesn't seem as quick as you hoped, don't immediately blame a modest hardware spec or Vista. Before upgrading any hardware or considering downgrading your OS, take a look at your installed programs and startup items. Just because it's brand new doesn't mean you won't have some spring cleaning to do.

If you do finally decide an OS downgrade is the only answer, check out this month's Hands On Hardware column on page 138 to see how I got on with XP on my Vaio TZ. **PCW**

Barry Fox

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Cautionary tales: part one

Even seasoned hacks aren't immune from the odd rude awakening via the internet, as Barry Fox discovers

We are continually warned to install PC protection, keep it up to date and set Windows to install critical patches. I do all this and more. My friends think me boringly over-aware of internet dangers. But I have twice recently had nasty wake-up calls.

I noticed some £8 monthly withdrawals from my credit card, identified as 'Shopdisc'. Initially I put this down to CDs and DVDs bought through Amazon from third-party suppliers. But during some months I had bought no discs.

I typed 'Shopdisc' into Google and found many posts from people who were paying £8 a month, usually after buying flowers or printed cards. But I hadn't bought any flowers or cards.

The credit card entries gave a number, which turned out to be a phone number for 'shopperdiscountsandrewards'. The first time I called, a recorded announcement directed me to a website that referred me back to the phone number and linked to a 'cancel centre', which required a password that I did not know.

'I shall never again dare to click "Yes" to an online cashback offer, which is a shame'

I started a Retailer Dispute process through my credit card company, which got the subscription cancelled and my payments refunded. The card company had received similar calls from others, so I phoned the UK Government's Office of Fair Trading. A press office spokeswoman said the OFT was "aware" of consumer complaints but "wasn't investigating". So I spent many hours trawling through old emails, spam traps and printouts of online transactions to establish how the company had got my authorisation to take £8 a month.

The audit trail led back to my purchase of display software from an online retailer. During the purchase process I had clicked 'yes' to the offer of a £10 voucher against future purchases.

A printout of the order shows the promise: "we will not pass your details onto third parties".

More printouts made during the transaction show links to 'one-time-offer.com', which gave me a printable voucher for "£10 cashback" on "any purchase" from the retailer (within three months).

I had missed a note at paragraph 28, near the end of three pages of verbiage. This note advised: "if you are 100 per cent satisfied during your trial, do nothing. All your Shopper Discounts & Rewards discounts and protection will automatically continue for just £8 a month, billed by Shopper Discounts & Rewards to the credit or debit card you authorised."

I then found emails from Shopper Discounts and Rewards, including a password, which had been discarded as spam. One was headed "Your £10 Cash Back Voucher towards your next purchase".

Another referred in the first paragraph to "your £10 Cash Back Voucher towards your next purchase," but then at around paragraph 24 used the same key words: "if you are satisfied during your trial, do nothing…"

Another had the key phrase in the eighth of nine paragraphs, "if you are completely satisfied…simply do nothing…"

So all along the onus had been on me to receive and carefully read the emails, and act to cancel my participation in the scheme.

I tried to contact the retailer but the company was rejecting emails to its Support address, blaming "the vast number of spam and spoofed virus messages" and insisting that "all contact is now made through our online ticket system". But this offered only a checklist of complaints and queries that did not cover the one I wanted to raise – why have you shared my credit card details with a third party, despite assuring "we will not pass your details onto third parties"?

I sent the full audit trail to the Office of Fair Trading press office but after two weeks and a reminder, I've heard nothing back. The scheme appears to be in use by many well-known shopping sites, including "Currys, Marks & Spencer, Asda, PC World and more", according to the Shopper Discounts & Rewards UK site.

I am now more wary of buying software online, which is a pity. I shall never again dare to click 'yes' to an online cashback offer, which is also a pity. And when I tell next month how I discovered that at least one big-name ISP is exposing its subscribers to hacking risks, I shan't waste time even trying to talk to the OFT quango. What would be the point? **PCW**

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Intelligent and nicely Phormed

Smart, intuitive and targeted advertising may be the only way to get people to actually read the adverts that pop up on screen

My pleasure at the imminent arrival of my new PC – a Spider family AMD box – is somewhat tempered by the realisation that it may not be powerful enough. In the real world, no computer is ever powerful enough, as I discovered last week, when my dual-core 64-bit Athlon slowed to less than a crawl – and not for the first time.

I opened up Task Manager to see what was doing it and found it was running an internet browser using 99 per cent of CPU time. I was surprised. I should have known. We've known since the first computers appeared that however much CPU power you provide, you will run software that uses it all. Double the power, and you'll find twice as much software: it's a law. It also applies to bandwidth and memory, of course. But as of three years ago, it really started to look as if the hardware people, with dual-core processors, multi-gigabyte memory and Gigabit Ethernet, had got ahead of the software providers. And I haven't even been loading all that much software. Had someone else loaded software on to my PC? Why... yes – the advertising industry had.

'However much CPU power you provide, you will run software that uses it all'

Every time you see one of those smart animated Flash displays at the top of a web page, your computer is working away to make the little images move. Every script loaded with your web page makes work for your computer.

Personally, I don't see this as an invasion of my privacy. Quite the opposite: if someone can find a way to send me advertising only for things I actually want, I'd see this as a premium service. I don't want to buy chocolate, teen rock music, nail varnish or Carling lager. If you can monitor my web surfing and restrict yourself to advertising fast sailing boats, clarinet repair services, classical music, high-tech toy updates and garden supplies, why, I might actually read the ads.

But that's not what the advertisers are doing. Instead, they are downloading adverts by the dozen. If you doubt me, I can point you at a particular website and you can count them. My machine tripped up when I made the mistake of going to a Fox News website. Try 'Fox business' and then poke around in Firefox, with Adblock installed. You'll be astonished. I went through one page there and discovered 43 script files, four iFrames, two web beacon images, three Flash files and 153 files downloading in the background.

Nothing wrong with my PC at all, it turns out. You could give us all desktop supercomputers, and, within two years, some clever ISP would have discovered a load of Javascript and Flash and other background operations made possible by all that power, and would be charging advertisers for the privilege of providing it to us.

So, Phorm. Remember the excitement recently when it was discovered that BT and various other ISPs were using Phorm services to spy on user web surfing? If you care to dig into the history of that scandal, you'll discover an interesting fact: the real reason Phorm became an issue goes back to July 2007, when a system manager discovered that his systems were running slowly. Investigating the reasons for this slowdown uncovered the proxy server that Phorm installed on BT internet systems: BT's support department then revealed this was an experiment.

If BT had simply said: "We're doing some proxy tests to do with adverts", and if Phorm had produced sharp, efficient code that ran on their own servers, the issue would never have come up. Indeed, Phorm was actually endorsed by Privacy International as privacy-friendly.

But what happened was that Phorm's programmers wrote code that was bloated and slow, and took the view that there's plenty of power on all those user systems, causing a major panic for a competent systems manager who suspected that machines had been hijacked.

Really, the future is Adblock. If we buy ultra-powerful multi-core PCs and allow other people to decide what software we run and what files we download, they will soon swallow up all the power we've created and, once again, task managers will show 'CPU utilisation 94%' and we'll complain how slow modern PCs are.

What this means for advertising is another story, but I'm not using my electricity to subsidise lazy coding by greedy ad purveyors any more. **PCW**

The evolution of broadband

2008 is supposed to be the year superfast broadband arrives in the UK. Nigel Whitfield takes a look at the harsh reality

We've been waiting a long time for it, but is the next generation of internet access finally upon us? With BT trialling fibre-optic connections to the home, cable offering up to 50Mbits/sec download speeds, and all the mobile networks competing to provide broadband on the go, has the UK finally got a network ready for the 21st century? Or is the fastest access available not to the many, but just a few?

PCW has been looking at the state of broadband in the UK regularly over the past few years, seeing how things have changed, and looking at what's on offer from the major ISPs. In this round-up, we take a look at what's really changing – and explore some of the reasons for the state we're in.

Too good to be true?

Imagine – you move into your new apartment and there's an Ethernet socket waiting in the living room; plug in your PC, work through the automated sign-up process, and a few minutes later you have a 25Mbits/sec connection, with 5Mbits/sec upload bandwidth. Or perhaps you've chosen a new home that comes complete with a fibre-optic connection, with the possibility of HDTV as well as high-speed internet access. And on the move, your laptop can download at over 7Mbits/sec, for a cost that not so long ago wouldn't even have bought you a 512Kbits/sec ADSL connection.

Can this really be Broadband Britain in 2008? The answer is yes – provided you live in the right place. Nevertheless, it's a welcome sign the state of internet connectivity is beginning to improve, if not at

Moving on up to IPv6

"The world is running out of internet addresses! We won't be able to add any more computers to it!" You might have heard that cry before. Last time round, it was fixed by the introduction of a new way of assigning addresses, called CIDR, that means an organisation can just be given eight IP addresses if that's all it needs, or 512 – rather than either 256, or 65,536. And CIDR has helped the internet carry on with its current core traffic protocol, Internet Protocol v4 (IPv4), for longer than some imagined. Most home users, and many companies, now use Nat (network address translation) to give them private addresses on their own networks, conserving public addresses even more.

But, as one of the internet's founding fathers, Vint Cerf, warned last year, sooner or later we're going to have to upgrade. That upgrade is to IPv6, a protocol designed some years ago, but still waiting to find widespread use. In February 2008, the internet's core name-servers – the systems that turn a name like **www.pcw.co.uk** into an IP address – finally had IPv6 addresses added to them. It's a small but significant step; before then, if a computer running IPv6 wanted to look up a domain name globally, rather than on a private network, it would have to send its request via the old IPv4 protocol.

As Vint Cerf warned last year, sooner or later the internet is going to need to move from IPv4 to IPv6

So, with the name servers working for IPv6, and major operating systems ready – Linux, BSD, Vista and Mac OSX all support it – is IPv6 ready for prime-time?

Not yet; outside trials, there's still not much widespread deployment of IPv6, though it has been mandated for US federal agencies this year, and other organisations around the world are likely to follow. So far, the number of IP networks running IPv6 is less than five per cent.

So, in the short term, home users don't need to worry; if you have to buy new kit, make sure it's ready for IPv6, but there's no need to throw anything out for a few years yet. If you do want to experiment, however, some ISPs such as Andrews & Arnold (**www.aa.gg**) offer IPv6 as an option now.

For a technical background on IPv6, go to **http://arstechnica.com/articles/paedia/IPv6.ars** and the IPv6 Taskforce is at **www.ipv6tf.org**.

the same speed for everyone. There's more good news, in that the state of the infrastructure is finally starting to be considered a national issue, not just one for the individual companies involved. So, how is broadband in the UK changing, and when will it start to affect you?

New technologies

The last time *PCW* looked at broadband in the UK (*PCW*, May 2007), we talked about the roll-out of BT's 21st Century Network (21CN) – and parts of that are now live, offering the same type of ADSL2+ 24Mbits/sec broadband connection in a Birmingham trial that other operators have offered via Local Loop Unbundling (LLU) in other areas. The 21CN project is the wholesale replacement of the ageing voice-centric circuit-switched telephone network, where data piggybacks on voice traffic, to a new data-centric packet-switched network based on the Internet Protocol (IP), with voice treated as just another form of data. It's a major development that will affect how voice and data traffic is handled throughout the UK.

By the time you read this, the trial will be more or less over, and as the rollout of 21CN continues around the UK, any ISP that resells BT's service will be able to offer the higher speeds. But, of course, to an extent, while the extra speed offered by 21CN will be welcome to many broadband users, it's not exactly new. If you can't wait for BT to upgrade your local exchange, some of the LLU providers may help – O2-owned Be (**www.bethere.co.uk**), for example, has announced a rollout of more exchanges that it says will provide coverage to 67 per cent of the UK population, including sites in Wales and Northern Ireland, which haven't always fared so well in the broadband stakes.

There are, however, some more interesting developments. Internet provider Ask4 (**www.ask4.com**) is presently boasting the UK's fastest broadband, with a 25Mbits/sec service that's delivered simply as an Ethernet point in some new apartment buildings. Plug in, sign up and – for £60 per month – you'll have a high-speed connection. There are slower speed options too, with a 2Mbits/sec connection coming in at £25 per month – and since the service is delivered over Ethernet, there's no BT line rental to pay on top of it. But this service is so far only available in a few apartment blocks and some student residences.

In a fibre network an Optical Network Terminal takes the place of the broadband modem we're used to

So what about the rest of us? If you're in a Virgin Media cable area, there's good news too; the cable provider has been trialling an upgrade in Folkestone, Ashford and Dover that will provide download speeds of up to 50Mbits/sec, with a wider rollout anticipated this summer – though as ever, those who take advantage of the higher-speed connection to download loads of data at peak hours are likely to find their usage capped or their bandwidth throttled.

A more interesting development, with potential for widespread high-speed net connections, is the first few experiments in Next Generation Access, or NGA. Improvements such as BT's 21CN are aimed at helping the core of the phone network improve, making it possible to bring higher speeds to the local exchange. NGA is about improving that last link, from the exchange to the home or office, usually by replacing some or all of it with a fibre-optic link.

Two acronyms you'll hear a lot about in this context are FTTH (fibre to the home) and FTTC (fibre to the cabinet, also sometime referred to as fibre to the kerb). The first of those is pretty self-explanatory – the connection into your home will be by a fibre-optic cable, providing much faster speeds than other connection methods. And it's not science fiction – at a new development in Kent called Ebbsfleet Valley (**www.ebbsfleetvalley.co.uk**) BT has committed to a trial where 10,000 new homes will have direct-fibre connections, ↘

providing them with 100Mbits/sec connections. Pricing is yet to be set, but the system is due to go live in August this year – and it's something that could be rolled out in future to other new-build developments. But as BT told us, it doesn't anticipate huge amounts of internet data being downloaded – in its view there aren't that many compelling uses for such a fast connection right now. Instead, it thinks the main use will be for delivering things such as high-definition TV, with a 100Mbits/sec pipe allowing several different HD streams to be viewed in different rooms simultaneously. At the home a device called an Optical Network Terminal (ONT) connects to the fibre, and, as well as an Ethernet connection for data, can provide other connections for telephone and video services.

Sadly, while FTTH is a great technology (as we explain in the box 'Korea can', right) there are problems that mean it can't be used everywhere in the UK. In many cases, though, FTTC is an attractive alternative. In this system, the links to the local junction boxes – those familiar, green street cabinets – are replaced by fibre, bringing the high-speed connection much closer to the home, and making possible something known as VDSL, or Very High Speed DSL. Essentially, this is a variant of the ADSL and SDSL that most users are used to, but since it's running over much shorter cables, far higher speeds can be reached, up to around 50Mbits/sec.

High-speed broadband isn't just about the internet. BT envisages much of the capacity being used for entertainment services, such as its BT Vision offering

Investment problem

Fibre is undoubtedly one of the most future-proof ways of delivering connectivity at the moment – but there's a potential problem. BT Openreach, which owns the network, is a privatised company, like the rest of BT. As such, it's expected to create a return for its shareholders.

Under the current regulations, though, if BT rolls out a new service on its network, then it'll be expected to make it available wholesale to all comers – so just as any ISP that resells BT's ADSL service will be able to resell services on the 21CN network later this year, so they'll be able to resell any services built on a future BT FTTH network. And that's just what will happen around August in Ebbsfleet.

Korea can. Why can't we?

Take a look around online, and you'll often find people pointing out that other countries have cheaper and faster internet provision than the UK – and it's true. But, sadly, that doesn't mean we can necessarily have the same, and there are some important factors that are often overlooked.

In many parts of Europe, cable television is more prevalent, and passes more than 90 per cent of homes, giving easier access to the network and greater economies of scale. In the UK, the comparable figure is 50 per cent – and the cable industry has only come together as one in the past two years, after starting out as a huge patchwork of organisations; on the continent, consolidation happened sooner.

But cable's not the only reason – it turns out that two of our key British obsessions also count against us in the broadband stakes – houses and mortgages. Places such as Korea, where just about everyone who wants it can have blisteringly fast broadband aren't like the UK. With our old housing stock and dislike of living in flats, 80 per cent of British properties are houses (according to the Office for National Statistics).

In London there are more purpose-built flats, but it's still only 32 per cent. Compare that with Seoul, where flats were just four per cent of housing in 1970, but had grown to 53 per cent by 2006. Installing a high-speed link to an apartment block means one fibre can serve hundreds of homes, rather than just the one that would be the case for a typical house, or a handful for a small converted house.

Providers offering at least 16Mbits/sec download speed

ISP	PACKAGE	CONTACT DETAILS	MONTHLY FEE	LINE RENTAL	SETUP FEE	MAX SPEED
Ask 4	Residential 25 Meg[1]	www.ask4.com, 0845 123 8710	£60	None	Free	25Mbits/sec
Be	Be unlimited	www.bethere.co.uk, 0808 234 8566	£22	£11[3]	£24	24Mbits/sec
Bulldog	Unlimited Plus	www.bulldogbroadband.com, 0800 107 5910	£24.50	£10.50	£30	16Mbits/sec
Newnet	Home SO ND	www.newnet.co.uk, 0845 684 0684	£29.95	£11[3]	Free	24Mbits/sec
O2	Ultimate broadband	http://broadband.o2.co.uk	£25	£11[3]	£15	20Mbits/sec
Sky Broadband	Broadband Max	http://broadband.sky.com/, 08442 410 285	£10[5]	£11[3]	£30	16Mbits/sec
UK Online	Up to 22MB Broadband	www.ukonline.net, 0800 0530606	£24.99	£11[3]	Free	22Mbits/sec
Virgin Media	Broadband Size:XL	www.virginmedia.com, 0845 840 7777	£37	None - cable	£25	20Mbits/sec

High-speed data via 3G mobile networks, monthly 'unlimited' contract

ISP	PACKAGE	CONTACT DETAILS	MONTHLY FEE	CARD COST	MAX SPEED	INCLUSIVE/FAIR USE DATA	CONTRACT LENGTH WITH FREE MODEM	SERVICES BUNDLED
O2	Web max	www.o2.co.uk, 0800 089 0202	£29.38	Free	1.4Mbits/sec	3GB	12 months	30 mins Wifi per month
Orange	Business Everywhere Unlimited	www.business.orange.co.uk, 0800 079 4000	£29.38	Free	7.2Mbits/sec	3GB	18 months	250 mins Wifi per month
Three	Broadband Max	www.three.co.uk	£25.00	Free	2.8Mbits/sec	7GB	12 months	
T-Mobile	Web'n'Walk Max	www.t-mobile.co.uk, 0845 412 2303	35[6]	Free	1.8Mbits/sec	10GB	24 months	Unlimited(30GB) Wifi access
Vodafone	Mobile Broadband Business	www.vodafone.co.uk	£29.37	Free	7.2Mbits/sec	5GB	18 months	

And our desire to own properties makes things complicated too; it's much easier to install high-speed broadband services, such as those from Ask4, at the construction stage, along with all the other utilities, but our slow rate of building means that's only just starting to happen. And while you can install connections as part of a refurbishment, as Ask4's Jonathan Burrows explained: "That's much easier when the whole building is owned by one company. Otherwise you have to make a separate legal agreement with each occupier."

So, while it may well be true that some countries are doing better than we are when it comes to provision of high-speed broadband, it's sadly not an issue that can be looked at in purely technical terms.

For BT – and for the rest of the country – this presents a thorny problem. What's the incentive for BT to invest billions of pounds upgrading the local network to fibre when it will have to allow other companies to come in and profit off the back of that investment? It won't be a small investment either, with some figures suggesting £10bn for fibre to the local cabinets, which would support VDSL, and £15bn for fibre to the home.

It's an issue on which Ofcom consulted last year, and the Government has even suggested it may be necessary to provide public investment to prevent the UK from being left behind.

In some parts of the UK, investment in broadband is already coming from the public sector, with projects such as Nynet (**www.nynet.co.uk**) in North Yorkshire providing services to other public-sector organisations via a fibre-core network, with a mixture of DSL and fibre, and some wireless links planned for more remote areas. South Yorkshire has a similar project, called Digital Region; both benefit from development funding from central government and the EU. But that funding's only available in certain areas.

So, until the broader issue of who will upgrade the whole of the UK's local network is solved, it looks like fibre to the home, or to the local cabinet, is likely to be something found principally in newly built developments. The rest of us will have to soldier on with our copper wires or cable modem connections.

And, of course, if we're to have high-speed internet access, investment isn't just needed in the 'access' section of the network. As we've already seen, BT's upgrading its whole network as part of the 21CN project, but individual ISPs have to invest in internet capacity too – and as the connections into the home get faster and faster, there's an ever-increasing likelihood of a difference between what it's theoretically possible to send to your home, and what you'll see when you're surfing – see 'The bandwidth gap' box overleaf for more on this.

The fastest broadband connections are likely to appear only in new buildings, like the Ebbsfleet trial, pictured, where installation is more cost-effective

Congestion and consolidation

The bandwidth gap is one problem facing ISPs and their users, but it's not the only one. Many people feel their internet connection

MONTHLY CAP	SUPPORT HOURS/COST	CONTRACT LENGTH	EQUIPMENT INCLUDED	SERVICES BUNDLED	COST OF CALL OPTION	INCLUSIVE CALLS
Unlimited[2]	8am-10pm, 10am-9pm weekends, 0845	1 month	None	None	N/A	N/A
Unlimited[2]	24 hour, Free	3 months	Wireless router	None	N/A	N/A
Unlimited	9am-8pm, Free	12 months	Modem	LLU Telephone	£12 for UK unlimited	To Bullgdog customers
Unlimited[4]	6am-10pm, 9-5 Sat, 0845	3 months	None	None	N/A	N/A
Unlimited[2]	24 hour, Free	12 months	Wireless router	None	N/A	N/A
Unlimited[2]	24 Hour, 0870	12 Months	Wireless router	None	N/A	N/A
Unlimited[2]	24 Hour, 0845	12 months	None	None	N/A	N/A
Unlimited	24 Hour, 0845	12 months	Modem	None	N/A	N/A

High-speed data via non-contract 3G mobile networks

ISP	PACKAGE	CONTACT DETAILS	PERIOD	COST	DATA LIMIT	CARD COST
Orange	Business Everywhere Daily	www.business.orange.co.uk, 0800 079 4000	Daily	£8.23	1GB	£57.57
Three	Broadband Lite	www.three.co.uk	30 days	£10.00	1GB[7]	£99.99
T-Mobile	Web'n'Walk Plus Daily	www.t-mobile.co.uk, 0845 412 2303	Daily	£4.00	1GB	£99.99
Vodafone	Mobile Broadband Business 24	www.vodafone.co.uk	Daily	£9.99	500MB	£175

NOTES: 1. Availability limited to a few residential developments; see website. 2. Unspecified limit, 'excessive use' not permitted.
3. Standard BT line rental BT line required. 4. Unlimited off peak (0200-0700), 25GB rest of month, additional 70p per GB.
5. Subscription to Sky TV is also required, £25 additional per month. 6. £44 per month for 12-month contract.
7. 7GB available for £25 per 30 days additional data 10p/MB. General note: Prices do not include introductory offers.

just isn't as fast as it should be. With many people on services that promise 'Up to' a certain speed, the reality is that most users receive far from the maximum. A survey in January by website Broadband Expert logged around 18,500 speed tests, with an average of 2.95Mbits/sec.

Of course, the headline speeds quoted for DSL services are based on short links to the exchange, and the speed falls off the longer the wire you're connected to – but most ISPs fail to explain that all but a few people will get much slower speeds than the headline figures in the ads. It's an issue that prompted a campaign in 2007 by *PCW*'s sister magazine *Computeractive* (**www.computeractive.co.uk/campaign**). Largely as a result of this campaign and the accompanying petition to the Government, Ofcom is now considering whether or not there should be guidelines put in place for broadband advertising, in line with the proposals from *Computeractive*.

But it's not just the issue of raw line speed that's causing problems. As one ISP that we spoke with pointed out, early adopters of broadband might have been told they had a 50:1 contention ratio on their line, but with relatively few people connected, they often enjoyed much better performance than that. As more people have switched to broadband, enticed by lower prices, contention is becoming an issue once more – especially with the rapid growth of services such as the BBC's iPlayer.

Consolidation in the industry is having an effect too, with the bulk of the UK's broadband now in the hands of a relatively small number of players, including BT, Tiscali and Carphone Warehouse. Even brands that many considered a cut above the rest in the past are now part of much larger outfits, often losing the personal touch and technical expertise that made them popular choices for the more technical user. Pipex, one of the first ISPs in the UK, has now been subsumed into Tiscali, for example, and many of its users have expressed concern at being moved over to the latter's LLU service. Smaller outfits, such as Nildram, had already been taken over by Pipex and are now essentially just a brand for marketing.

While you might hope that larger ISPs would benefit from economies of scale and be able to invest in greater bandwidth for their users, sadly that's not always the case.

'Brands that many considered a cut above the rest in the past are now part of much larger outfits, often losing the personal touch'

As we were told by one smaller ISP, with the UK's broadband market being taken over largely by big firms competing on price and offering bundles that include telephony too, there's a race to grab market share at whatever cost – and that may not leave much cash for investing in things such as Next Generation Access or upgrading external bandwidth. As many readers will agree, it hasn't left much left to invest in technical support or quality of service.

While a very few ISPs do aim to sell on speed, or quality of service, the larger players are concentrating on convergence – providing services such as BT's Vision, with TV via the broadband connection, or Unique from Orange, where a special mobile phone can switch to making calls via the broadband link when you're at home. There are clear advantages to both these types of idea – video content can be provided from within the ISP, reducing the need for external bandwidth, and telephony doesn't use up much capacity either – and both have a high perceived value to the customer. As the market consolidates more, it's likely that broadband connections will be sold on the number of things – video, VoIP (Voice over IP), seamless roaming, Wifi access – included, rather than on speed alone.

A typical small ISP that spoke to *PCW*, Wizards (**www.wizards.co.uk**), told us that while there's still a market for ISPs that can do more bespoke solutions, or offer better handholding, it's not an easy one – and without other services such as consultancy to offer, your business plan is often at the mercy of BT and the way it prices its wholesale services. Remarkably, Wizards told us that for the first time in ↘

A bandwidth-hungry services such as the BBC iPlayer grow, many users are starting to find that congestion and contention are becoming a problem

The bandwidth gap

As users clamour for faster broadband, ISPs are starting to have a problem on their hands. Already some have made a fuss about the BBC iPlayer, and the amount of capacity that it's consuming, and things can only get worse from here.

Contention isn't something we hear about too much these days, but it's going to bite with a vengeance. Many ISPs have kept ahead of the game so far, investing in bandwidth as common speeds have crept up from 512Kbits/sec to 1Mbit/sec, then 2Mbits/sec. But going from there to the 24Mbits/sec of ADSL2+, or the 50Mbits/sec and higher that fibre might offer is a different proposition – especially when you consider the ISP has to buy uncontended bandwidth to share between all its customers.

Ultimately, there's a big problem – even with 50:1 contention, an ISP with 10,000 users each with a 50Mbits/sec connection needs 10Gbits/sec of bandwidth to keep them all happy – and that's a real issue, both technically and economically.

So, as end-user speeds creep up, ISPs will have to either raise their prices, or look at providing a lot of content from within their own networks. For many, that's going to take the form of video on demand, HDTV and similar services. Expect the emphasis not to be on the raw speed of the internet connection you have available – even if you have 50Mbits/sec, you're not going to find many servers that will let you download at that speed, when they're coping with other people too – but on the ability of the connection to seamlessly provide you with entertainment, telephone and similar services at the same time as you're browsing or downloading.

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- features
- capacity

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years it has started to be asked about leased lines by their customers.

Before the days of widespread DSL, a leased line was a typical way for a small business to connect to the net – but it could cost hundreds of pounds a month for even a 64Kbits/sec link. These days, it's rather cheaper, but you could still spend around £4,000 per year on a one megabit connection, giving you guaranteed bandwidth and – most importantly for some businesses that have suffered long and expensive failures of ADSL and SDSL services – a service level agreement (SLA) guarantee, that won't leave you without a connection for days or weeks.

We'd be interested to hear from readers whose ISP has been bought out by a larger outfit, and whether your service changed as a result – email us at letters@pcw.co.uk.

Going underground

One of the biggest problems faced by companies such as BT is the sheer cost of laying new cable. Digging up streets is expensive, and can cause widespread traffic chaos. So it's no wonder the latest technologies are going into new-build schemes such as Ebbsfleet Valley. But one company thinks it may have an attractive alternative for installing fibre to many locations in the UK.

H20 networks has developed a system that uses the existing sewers as a conduit for fibres, breaking out into ducts close to buildings for the final section of the link. It means that, especially in cities, there's no disruptive work in the streets, and the links can be installed quickly. Already there are systems up and running in Aberdeen, Bournemouth and Edinburgh, and residential ISP Ask4 is also using it for parts of its network.

● H20 Networks **www.focuss.net**.

By using the sewer network, H20 can install fibre networks quickly and much more cheaply than by digging up the road

Mobile broadband

When we last looked at mobile broadband (*PCW*, December 2007, **www.pcw.co.uk/2201214**), 3 had just announced its new service, and while both Vodafone and T-Mobile had data packages, the cheapest of them only just scraped in under the £30 mark – three times as much as the most basic offering from 3. O2 and Orange, meanwhile, stood out for monstrously uncompetitive rates on data.

Almost all the UK's mobile networks now provide reasonably priced access via compact USB modems

As we predicted at the time, things would only get better and most of the networks have reduced their prices – all except O2 now offer mobile broadband packages with a 3GB data allowance for £15 per month. O2 – perhaps hoping to wow people with the iPhone instead – offers a 'Webmax' tariff with 3GB of fair usage for double the price, with a USB modem that's more than twice the size of compact models available from other networks.

When it comes to speed, Vodafone and Orange both claim speeds of 'up to' 7.2Mbits/sec, with 3 claiming 2.8Mbits/sec. But it all depends on exactly where you are in the UK; even on the networks that offer higher speeds, it's worth checking coverage carefully before parting with your cash – especially as the best prices are often for 18- or 24-month contracts. You may very often find that speeds will drop back to 1.4Mbits/sec or even lower. While most of the networks are working on expanding their coverage, if you want something to while away the evenings on a visit back home from the big city, you'll find coverage is still patchy, and that, rather than price, may determine the network you'll have to use. Also worth watching out for is HSUPA support, which all the networks should have to some degree by the end of this year – it boosts the upload speed to as much as 1.4Mbits/sec.

Another welcome bit of news is if you don't want to be tied to a contract, you don't have to be ripped off, either. Orange, T-Mobile and Vodafone all have 'daily' tariffs, where you just pay when you use the modem; Orange charge £8.23 for a day's access, with a 1GB download limit, and £58 for the USB modem. On T-Mobile you'll pay £99.99 for the modem, and £4 per day for 1GB, while Vodafone charge £175 for its USB modem and £9.99 for a day, with a 500MB download cap. 3 offers a slightly different pricing structure based on top-up vouchers, where you pay £99.99 for the modem and then for £10 you can buy 30 days' pay as you go access, with 1GB over the 30-day period.

If you need mobile access for a few days at a time, it can be cheaper than the alternatives – and it'll include roaming on 3 networks in Ireland, Austria, Italy and Hong Kong – but heavy users might prefer the per-day limits and charges of the other networks. But whatever option you choose, be careful if you roam abroad: remember the widely publicised case of the chap who ended up with an £11,000 bill for a mobile download of a TV show, due to the download resuming while he was on a business trip in Germany, where he incurred a £4.99 per MB roaming charge.

'Be careful if you roam – remember the widely publicised case of the chap who ended up with an £11,000 bill for a mobile download of a TV show'

Where next for Broadband Britain?

Mobile broadband may be improving, and wireless links such as Wimax will continue to roll out – albeit at a very slow pace – but when it comes down to it, if you want a really fast broadband link, you need a fixed physical connection.

As projects such as BT's Ebbsfleet trial, Ask 24's residential services, and the wider rollout of ADSL2+ show, faster connections are coming – but so is the crunch. Before internet users in the UK can all have the really fast network connections that some of these trials offer, there needs to be a dramatic change in the way internet connections are regulated and funded. Without substantial investment – and that means ensuring companies are allowed to benefit from their investment too – there's a real chance the fastest internet connections will remain the province of those fortunate enough to live in new buildings or areas targeted for special projects.

Ultimately, that means Ofcom – and the Government – need to think hard about a lot more than just the poster speeds advertised by ISPs. **PCW**

Taming Vista

Windows Vista can be confusing to the uninitiated, so Paul Monckton provides solutions for 20 of the worst annoyances

As a relative newcomer, Vista can't boast the maturity and stability of Windows XP. Despite Microsoft's bold claims, the operating system still retains some kinks that need to be ironed out. Compared with XP, many new features have been added, but early adopters have been frustrated by some seemingly unnecessary changes, as well as compatibility and performance issues.

In some cases, it's just a matter of getting used to the way Vista does things, but there are some XP features missing in the new operating system that users would like to have back. Similarly, some of the new features in Vista can be downright annoying. It's inherently a more secure system, but, much like at an airport, added security comes with no small measure of inconvenience.

In this feature, we'll look at 20 of the most common issues facing users new to Vista and show you how to deal with them.

User Access Control dialogues

1 For many, this is probably the most irritating Vista feature of all. You'll probably encounter it within minutes of using the operating system and it'll continue to bug you on a regular basis.

Any tasks that require administrator privileges to run require you to explicitly authorise them each time. This takes the form of a dimmed screen and a dialogue box alerting you to the fact that a program needs elevated privileges to continue.

Of course, preventing user programs from performing unauthorised functions is a good thing. Without access to privileged system components, malware is unable to wreak the havoc it enjoyed under XP. Most other modern operating systems have a similar security system. However, Vista's implementation can be disruptive to your work.

Although we wouldn't recommend it, User Access Control (UAC) is easy to turn off. Open up the control panel and go to User Accounts. Under 'Make changes to your user account', the bottom option is 'Turn User Account Control on or off' (see screens 1 and 2).

UAC screen dimming

2 When the UAC prompt appears, your desktop is dimmed and access to all applications is blocked until the prompt is dismissed. Microsoft calls this Secure Desktop.

You'll probably find Vista switching to the Secure Desktop very annoying. For example, you may be watching a video on one screen while working on another, or perhaps engaging in an important online conversation. The last thing you want is to have the screen dimmed and access to your application prevented.

Although the purpose of the Secure Desktop might not be immediately obvious, it provides a significant additional level of security. Because running applications have no access to the Secure Desktop, there's no way for a rogue application to spoof your mouse clicks and authorise the UAC dialogue itself – so disable it at your own risk.

You can, however, disable the Secure Desktop while keeping UAC enabled. This means you can carry on working in other applications and attend to the UAC prompt in your own time.

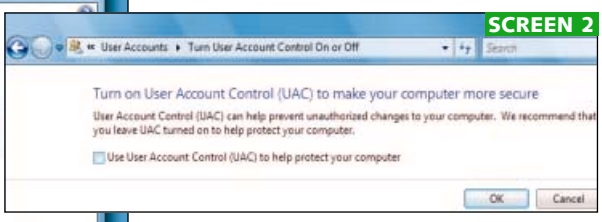
If you have a Business edition of Vista or Vista Ultimate edition, disabling the Secure Desktop is easy. Simply run 'secpol.msc' from the Start menu or a command prompt and navigate to Local Policies, then Security Options. Scroll down to 'User Account Control: Switch to the secure desktop when prompting for elevation', double-click and select 'Disabled'.

If you have the Home edition, you'll have to edit the Registry directly, so take the usual precaution of backing up your system, then open regedit and browse to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Policies\System.

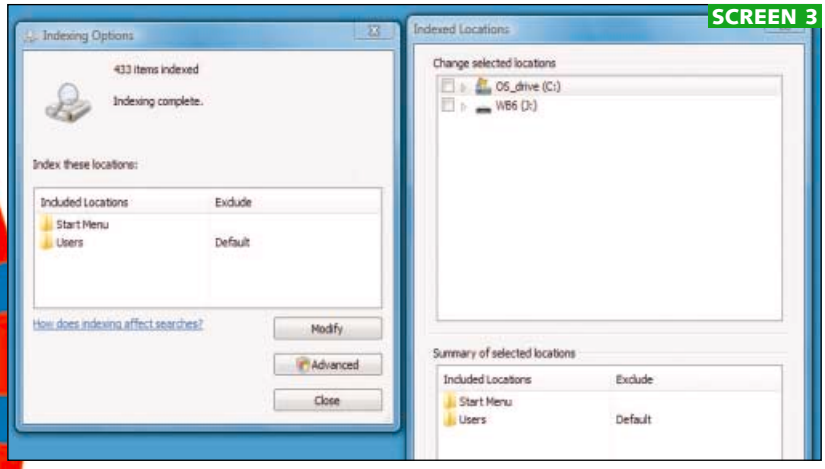
Create a new 'DWORD (32-bit) value' by right-clicking on the right-hand pane. Give it the name 'PromptOnSecureDesktop' and set its value to 0.

The Aero slowdown

3 Vista's Aero Glass interface looks great, but it requires some real graphics horsepower to run properly. If your



Vista's User Account Control is a frustrating interruption for many of its users



Don't index your whole disk and you may see a performance boost

system is borderline when it comes to meeting hardware requirements, you may find it's not able to run the interface as fast as you'd like.

The obvious option is to disable Aero and swap to Windows Vista Basic mode. The control to do this is a little hidden: open the Control Panel and go to Personalization, then Window Color and Appearance. Select 'Open classic appearance properties for more color options' at the bottom, then choose Windows Vista Basic.

This will disable the transparent desktop effects and features such as Flip 3D and live thumbnail previews. If you want to keep the latter options, keep Aero running, but disable the transparency effect by going to the Window Color and Appearance window and unchecking 'Enable Transparency'.

You can also perform the same function from the command line by typing

```
Rundll32 dwmApi #104
```

to disable the effect and

```
Rundll32 dwmApi #102
```

to re-enable it. These commands can be made into desktop shortcuts, or added to the Windows context menu – see Tip 8 below.

Indexing slows down your PC

4 Many of Vista's new features are designed to make your life easier, to make you more productive and to speed up the way you interact with your PC. Unfortunately, many require a jolly fast PC if they're to work well.

Vista's enhanced indexing service is a prime example of such a feature. Integrated into just about every Explorer window, it lets you type a few letters of whatever you're looking for and the results are displayed almost instantaneously.

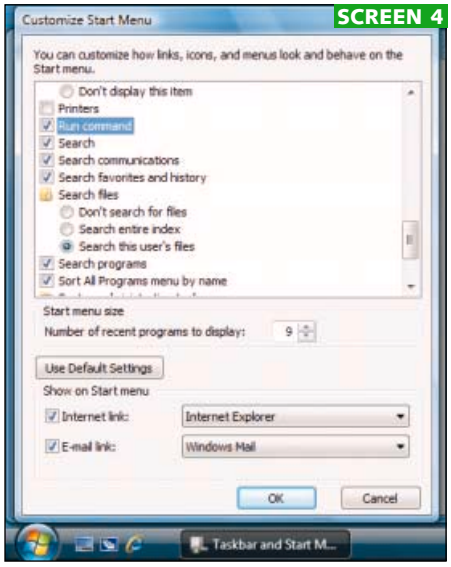
If your PC is slow, it won't be instantaneous. All that indexing in the background is going to make everything else slower, too. If this is happening to you, turn it off. To do that, open the Control Panel and select Indexing Options. Select Modify and then 'Show all locations'.

From here you can enable or disable indexing for any selected locations. If you have any hard drives checked, unchecking them will give you a general performance boost at the expense of slower searches (see screen 3). We would recommend keeping indexing turned on for the Start Menu, so you'll be able to locate programs quickly with only a negligible impact on performance.

Adding Run to the Start menu

5 XP has a nifty way of running things – the very convenient 'Run' command found in the Start menu. Navigating through menus is for newbies. When you know the command you need, you just want a quick way of typing it and getting things done. Additionally, many online guides and tutorials that work on both XP and Vista make liberal use of the Run command.

So why did Microsoft remove it in Vista? Well, it didn't: it's just disabled by default. To put it back, simply do the following: Right-click on the Taskbar and select 'Properties'. In the 'Start Menu' tab, make sure 'Start Menu' is selected and click on 'Customize'. Scroll down until you find the 'Run command' entry and tick the box (see screen 4). Alternatively, you can access the Run prompt by pressing Windows & R, whether or not the option is enabled in the Start Menu.



The Run command is disabled by default, but you can easily return it to the Start menu

Add XP machines to Vista's Network Map

6 Vista's Network and Sharing Center provides the facility to view a map of your entire network, including PCs, switches and gateways. Unfortunately, PCs running XP don't show up in the map.

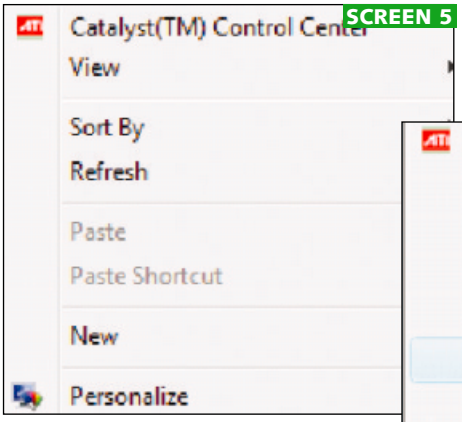
You can't do anything to Vista to fix this. Instead, you must download the Link Layer Topology (LLTD) Responder for Windows XP from Microsoft's support site (search for Knowledgebase article KB922120). Install it on your XP machines, enable File and Printer Sharing and your XP systems will now show up in the Vista network map.

Solving dual-boot problems

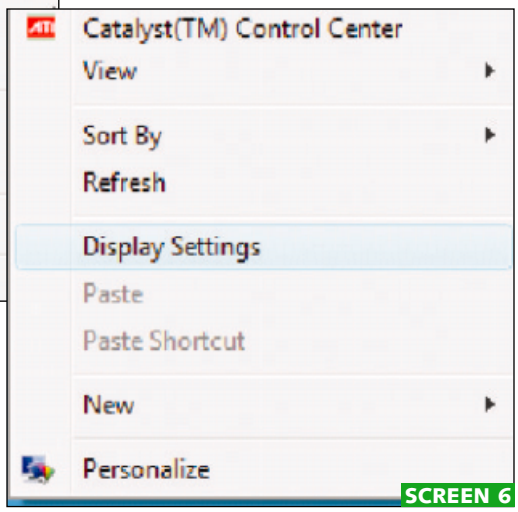
7 If you're already running XP and you want to install a copy of Vista on a different partition or drive, it's easy to do. Vista will automatically preserve your XP installation and create a boot menu so that you can choose which OS you want to run.

However, if you've taken the plunge and have gone for a Vista-only system, you may discover later that you need to run XP to cope with all those incompatible applications, missing drivers and slow-running games.

Unfortunately, adding XP as a second operating system to a PC already running Vista doesn't work as seamlessly as the other ↘



SCREEN 5



SCREEN 6

Before (left) and after (right): You can add Display Settings to Vista's context menu

way round. If you install a 'pre-Vista' version of Windows after Vista, it will overwrite Vista's boot record and Vista will no longer be available.

The old XP method of editing your boot.ini file won't work either, because Vista has an entirely new method of managing system boot-up called Boot Configuration Data Store. To get back to Windows Vista after installing XP, you can run the following command from the Vista installation DVD:

```
n:\boot\bootsect.exe /NT60 ALL
```

where n: is the drive letter of your DVD drive.

Restarting the system after issuing this command will cause your PC to boot back into Vista. To add XP to your boot menu, you need to edit Vista's BCD Store to add an entry for the older operating system.

To manage the BCD Store, Vista provides the 'bcdedit' command. As it's a system tool you'll need to run it from a command window with administrator credentials. From within Vista, we can use bcdedit to add a boot entry for XP by issuing the following commands:

```
bcdedit –create {ntldr} /d ↙
'Windows XP'
bcdedit /set {ntldr} device ↙
partition=x:
```

(Key: ↙ code string continues)

where x: is the drive letter for the active partition

```
bcdedit /set {ntldr} path \ntldr
bcdedit /displayorder {ntldr} ↙
/addlast
```

For more information, see Microsoft's help at **http://support.microsoft.com/kb/919529**.

Desktop display settings

8 Sometimes you need to change the desktop display settings. On XP the Display Settings option was really easy to get to; just a right-click on the desktop and it's there. Vista, on the other hand, has reorganised many of these control dialogues and forces you to make many more mouse clicks to reach the same point. You need to right-click on the desktop, click Personalize, then at the bottom of that list you'll find Display Settings.

You can make a shortcut that points directly to the Display Settings panel. In any folder, right-click and select New, then Shortcut. You'll be prompted for the location of the item to which you need to link. Type 'C:\Windows\System32\desk.cpl' and click Next. When prompted to name the shortcut, type 'Display Settings' and click Finish.

You can then click the shortcut to bring up the Display Settings dialogue immediately, or add the shortcut to the Quick Launch toolbar for even more convenient operation.

That method certainly cuts down on mouse clicks, but if you really want to emulate the way XP does it, you'll need to add the Display Settings command to the desktop's context menu. With a little tweaking of the Registry, you can add your own commands to the menu fairly easily.

To add the Display Settings option, open up Regedit and browse for the key HKEY_CLASSES_ROOT\Directory\Background\shell.

Right-click on 'shell' and select 'New Key', then name it 'Display Settings'. In the right-hand pane, double-click on the (Default) string and enter the value 'Display Settings'. Now, back in the left-hand pane, right-click on your Display Settings key and select 'New', then 'Key' to create a new sub-key. Name this sub-key 'command'. In the right-hand pane, double-click the command key's (Default) string and enter the value 'RUNDLL32 SHELL32.DLL,Control_RunDLL DESK.CPL,@0,3' without the quotes.

Now close Regedit and right-click anywhere on the Windows Desktop. Your new 'Display Settings' menu item should bring up the Display Settings dialogue, just like XP (see screens 5 and 6). You can use this technique to add anything you like to the context menu. For example, you could add the options we discussed to turn Aero transparency on and off, without the need to enter any control panels.

Menu bars in Windows Explorer

9 In Windows XP, Explorer windows contain the familiar "File, Edit, View" toolbar which we frequently use to carry out common operations on files, such as Cut and Paste. By default, Windows Vista doesn't show this menu, which is highly frustrating for the XP user new to Vista who just wants to get things done quickly.

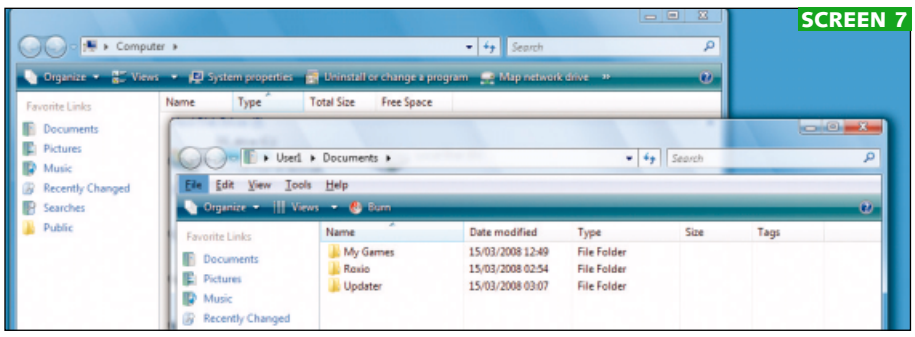
Thankfully, if you know the trick, this is one of the easiest annoyances to overcome: simply pressing the Alt key will make the menu pop up so you can use it as normal (see screen 7). If you want to keep the menu displayed permanently, go into the Tools menu (remember to press Alt to make it appear) and select Folder Options, then the View tab. Under Files and Folders tick the 'Always show menus' item.

Windows Vista needs more memory

10 Vista stresses PC hardware to a greater extent than XP. If your hardware is close to Vista's minimum spec, there's a good chance your experience isn't going to improve without some sort of upgrade.

It's generally the case that newer versions of Windows require not only beefier PCs, but also more system memory. This is especially true of Vista, for which we would recommend a minimum 2GB of Ram for the best user experience. If you have an older PC, then 2GB of Ram would more than likely have been considered an unnecessary extravagance at the time you bought it.

If you want your menu bar back, press Alt and check the Folder Options



SCREEN 7

However, times have changed and today perhaps the cheapest and most cost-effective upgrade you can perform is to increase your system Ram. If you haven't looked at memory prices for some time, you may find them considerably lower than you expect.

Of course, a system memory upgrade will involve opening up your PC case. If you're unwilling to do this, see tip 11.

If you're confused about which type of memory to buy, many online vendors, such as Crucial (**www.crucial.com/uk**), offer online diagnostic tools that will tell you how many free memory slots you have and automatically recommend the correct memory specification for your PC.

Vista needs more memory – Part II

11 If you don't want to, or can't, install additional internal Ram then Vista has a handy feature called Ready Boost, designed specifically to help you. Ready Boost uses a standard Flash memory card or USB memory stick to boost Windows' virtual memory performance, helping those of us with a restricted memory budget to avoid the hard disk thrashing, which can so easily cripple a PC's performance.

Thankfully, Flash memory, like system Ram, is also relatively inexpensive, but do make sure you buy memory with the required performance characteristics to run Ready Boost. Many Flash sticks, especially older products, simply aren't fast enough.

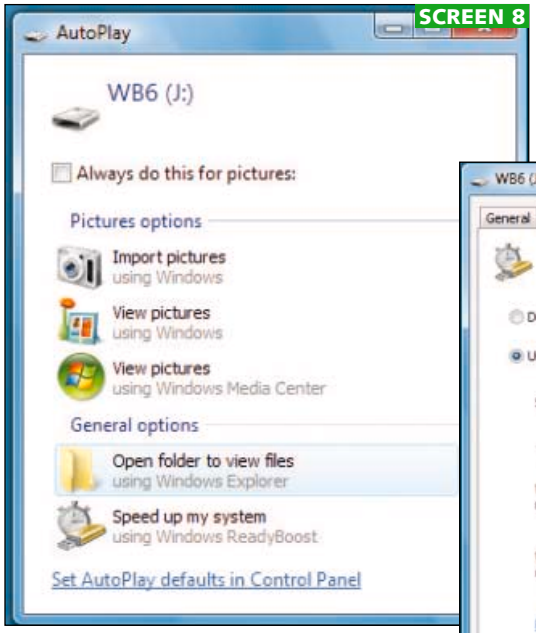
You probably have some USB Flash memory already. If so, just plug it in and try it. Vista will test the memory automatically to see if it's fast enough for use with Ready Boost. Plug in the device and select 'Speed up my system from the Autorun menu (see screens 8 and 9). Windows will let you allocate up to 4GB of space for Ready Boost.

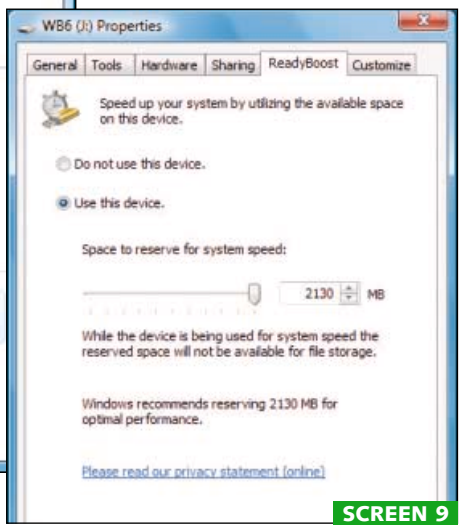
For best results, buy Flash memory of at least the same capacity as your system memory. If you don't want a large USB dongle hanging out of your laptop the whole time, many modern notebooks have built-in Flash memory card readers that may be suitable for Ready Boost, allowing you to use standard SD cards and sparing you from those cumbersome protrusions.

Network copying is slow in Vista

12 Using the desktop to copy files to and from a network share in Windows Vista is much slower than doing the same using Windows XP. It's a bug and Microsoft has fixed it as one of the few major performance improvements in Vista Service Pack 1 (see our feature on page 50 and Hands On Networks, May 2008).

Your file transfers should therefore be speeded up automatically when Service Pack 1 is offered to you via Windows Update, which should be the case by the time you read this. Alternatively, you can download the service pack manually from Microsoft Downloads at **http://downloads.microsoft.com**.





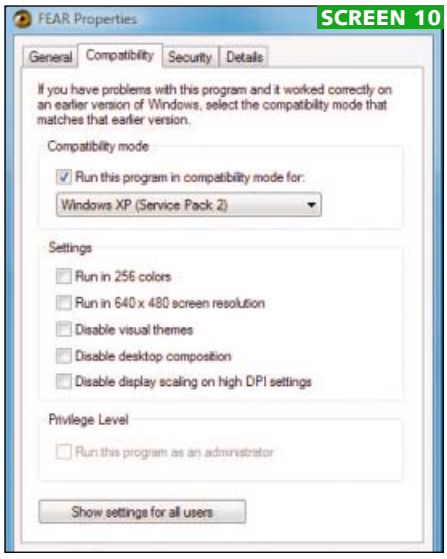
If you don't want to upgrade Ram, use a memory stick to boost performance

Programs stop working with SP1

13 Unfortunately, as well as fixing problems such as slow file copies, major updates such as service packs sometimes cause additional incompatibilities. Microsoft acknowledges that some applications that worked well with the original release of Vista have stopped working with SP1. A list of such applications is provided below, many of which already have updates available to make them compatible with the new service pack.

However, if you use any of the programs we've listed below, read Microsoft's support page at **http://support.microsoft.com/kb/935796** and check with the relevant software vendors for updates prior to installation.

- Bit Defender AV or Internet Security 10
- Fujitsu Shock Sensor 2.1.0.0



- Jiangmin KV Antivirus 10 and 2008
- Trend Micro Internet Security 2008
- Zone Alarm Security Suite 7.1
- Iron Speed Designer 5.0.1
- Xheo Licensing 3.1
- Free Allegiance 2.1
- New York Times Reader 1
- Rising Personal Firewall 2007
- Novell ZCM Agent 10.01

Make programs work

14 There are many programs that won't work with Windows Vista after a normal installation. This is usually restricted to older software, especially bespoke applications, which weren't written with long-term compatibility in mind. However, Vista brings with it many fundamental changes that couldn't have been predicted at the time much of the software we still use today was written.

Perhaps the biggest shift that programmers have had to deal with is the new approach Windows Vista takes to system security. Until now, programmers have been free to access pretty much any part of the file system they wish and most programs enjoyed administrator-level privileges. Under Vista, programs must play by the rules. They can't create temporary files in folders that are protected by the system, such as 'C:\Program Files'. Vista takes some steps to shift things around behind the scenes to get around this, but it won't always work.

To improve Vista's compatibility with such programs you should use the built-in compatibility modes provided by the system. Right-clicking an executable file will bring up the Properties window, including a

Some things run better in Vista's compatibility mode ↘

SCREEN 11

Add Solitaire and other games to Business editions of Vista

Compatibility tab. Here you can select an operating system under which the program is known to work, as well as giving it automatic administrator credentials (see screen 10).

If you do this latter step, though, you'll bring up the UAC elevation prompt every time a non-admin user runs the program.

Vista is too expensive

15 If you'd like to try Vista but are put off by the price, you can save a lot of money by purchasing an OEM copy of the operating system.

You'll see OEM copies available from many vendors for less than half the price of full retail versions. Be warned, however, that OEM versions carry different licensing terms to Retail and Upgrade versions. Most importantly, OEM versions are licensed only to the PC on which they were first installed.

If you buy a new PC (or install a different motherboard), you can't take your copy of Vista with you. Furthermore, they come without technical support from Microsoft. Support for OEM copies is to be provided by the OEM vendor, and if you bought the software for your own use, that vendor is you!

OEM copies of Vista come in either 32-bit or 64-bit versions, but you have to choose one at the time of purchase.

My system won't hibernate

16 If your hard drive has become over-full you may have run Vista's Disk Cleanup utility. One of the options is to remove the Windows Hibernation File using the Windows Hibernation File Cleaner. If you're desperate for disk space, it's often helpful to delete it as the file, being equal in size to your system Ram, is usually rather large. However, once this file has been deleted it can be tricky to re-enable hibernation at a later date. To turn hibernation back on after the hibernation file has been cleaned away, open a command prompt window as administrator and type

```
powercfg /hibernate on
```

Your hibernate function should now be restored.

Vista won't let me access certain files

17 Vista guards its system files far more jealously than any Windows operating system before it and employs strong methods to protect them. Even when running with admin credentials, it's possible to come across protected files that can't be deleted or edited.

If you really need to modify such files, you first need to take ownership of them and give yourself permission to edit them. Two new Vista commands enable you to do this and should be run as administrator from a command window.

To take ownership of a file, type

```
takeown /f '<file>'
```

where <file> is the name of the file you wish to modify. The file will now come under the ownership of the user who issued the command. Now, to enable full control over the file type

```
cacls <file> /G <username>:F
```

where <file> is the again name of the file and <username> is the name of the user for whom the access rights are to be set. ':F' specifies full control over the file.

For a full list of options associated with these commands, type either `takeown /?` or `cacls` (no arguments) for a full list of options.

Solitaire in Vista Business Edition

18 If you have a Business version of Vista, chances are you're not meant to be using your PC for playing games. The usual selection of Windows games is therefore not available.

However, if you really want to play them, you can enable them via the Control Panel. Select Programs and Features and then 'Turn Windows features on or off' from the Tasks pane. In the Windows Features dialogue, place a tick in the box next to the entry marked Games. You can enable individual games by expanding the Games entry and turning them on or off (see screen 11).

However, if you're using a work PC, you may be out of luck, as administrator credentials are required to re-enable the missing games.

Accessing the administrator account

19 If you're used to XP, then you'll know it comes with a built-in administrator account. Vista also has an administrator account, but Microsoft doesn't want you using it unless you know what you're doing. For that reason, Vista's admin account is disabled and hidden from view. You can enable the account by opening up a command prompt as administrator and issuing the command

```
net user /Administrator /active:yes
```

Once activated, the administrator account should appear alongside your normal users at the sign-on screen (see screen 12). Similarly, to deactivate the account, type

```
net user /Administrator /active:no
```

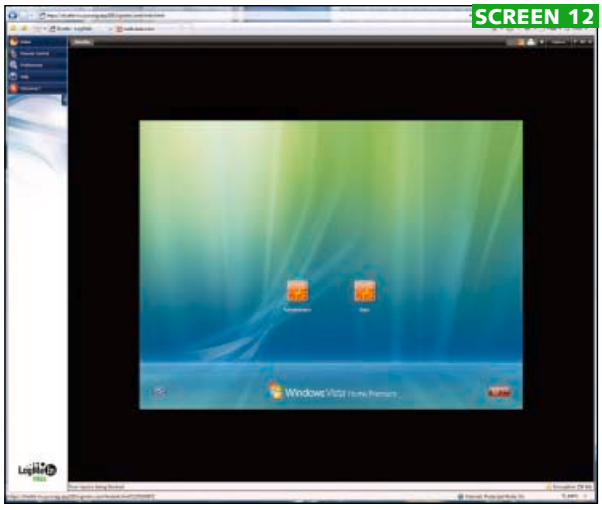
This 'true' administrator account has far greater privileges even than normal user accounts that are configured as system administrators. It should therefore only be used with extreme caution, and certainly not as your day-to-day account.

Tweaking the Vista Registry

20 Some of us are a little squeamish when it comes to editing the Registry, and quite rightly. Thankfully, those of us who prefer to keep the guts of the operating system out of our faces and avoid the risks of botched hacks can use Tweak Vista, a handy utility from Stardock. Tweak Vista is designed to help you take control of Windows Vista without getting your hands dirty, safe in the knowledge that any tweaks can be reversed.

Many of the fixes we've described here, including UAC settings and managing system services, can be performed using Tweak Vista. It also comes with plenty of help and background information, as well as a built-in Vista-based mini news feed to keep you up to date with the latest updates and bug fixes.

Tweak Vista can be purchased online at www.stardock.com for $19.99. A free trial version is also available. **PCW**


SCREEN 12

Enable Vista's administrator login for even higher system privileges

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Saviour of the universe

Flash memory is one of today's most ubiquitous storage technologies. Terry Relph-Knight investigates

Imagine a mobile phone that lost all its numbers when you took out the battery. Or a digital camera that you had to keep charged, otherwise your holiday snaps vanished. Both would be pretty useless to most of us. And while we might expect a really old radio to lose the stations we've stored if it's unplugged, we don't expect it of a new one. Whether we remember to charge it up or not, we assume our MP3 player will have all our tunes, just as soon as it's powered up.

For all these things, we rely on non-volatile memory, which carries on holding data when the power is removed. In most modern devices, that means Flash memory – compact, cheap, and found inside just about everything electronic. It's even supplanting the hard disk, with products such as Apple's new Macbook Air available in an entirely Flash-based version, and the Asus Eee PC relying on it too.

So just what is Flash memory, how does it work, and is there really a difference between the brands and types that, increasingly, you can even pick up at the supermarket with your groceries? In this feature, we'll explain all you need to know.

How Flash works

If all you want to know is what's different between one brand of Flash and another, skip ahead to the section on buying Flash. But if you want to know the technical details, read on. Flash memory works by storing tiny electrical charges, representing individual binary bits. These charges can be retained for many years by the right type of materials.

Flash memory uses a specially configured transistor (technically it's a metal-oxide-semiconductor field-effect-transistor or Mosfet) to store each of these charges. A 'normal' Mosfet has three connections, referred to as Source, Drain and Gate (see diagram below). The 'channel' between the source and the drain conducts current under control of the voltage present on the gate terminal. A Flash Mosfet has an extra gate layer underneath the main gate terminal. This is a 'floating' gate, so called because it's surrounded by an insulating layer. When the floating gate becomes charged, it partially screens the effect of the main control gate.

The memory cell is read by placing a voltage on the control gate, and the presence or absence of a charge on the floating gate, affects the current flowing between the source and the drain, revealing the information stored.

The floating gate is charged by applying a higher voltage to the control gate, causing current to flow between the source and the drain, which induces some electrons to charge the floating gate via a process known as hot-electron injection.

Cells are erased by applying a large reverse polarity voltage pulse between the control gate and the drain, which pulls electrons off the floating gate in a process called quantum tunnelling.

On-chip charge pumps are used to generate the voltages required for programming and erasing the memory cells, enabling Flash memory chips to run off a single low-voltage supply rail.

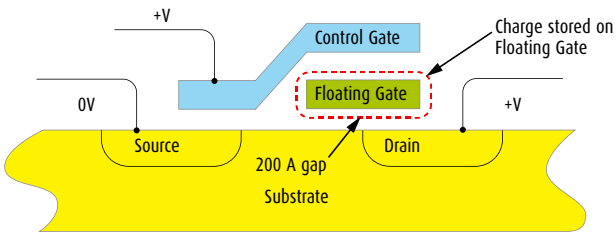
Flash memory technology is an offspring of the earlier EEPROM (electrically erasable, programmable, read-only memory), which was invented as a convenient means of storing firmware that could be updated without having to remove the chip from the device it controlled. EEPROM technology supports only occasional write cycles and is relatively slow. Flash, as the name implies, has faster read and write times and allows a much greater number of write cycles.

The main reason for Flash's speed is that its programming cycles affect whole blocks of memory, rather than individual bytes as in an EEPROM.

Flash was invented in 1984 by Fujio Masuoka at Toshiba. A colleague, Shoji Ariizumi, reportedly suggested the name 'Flash' because the burst of high voltage applied during the erasure process reminded him of the flash of a camera.

It's possible to build Flash memory chips using either a NOR or NAND logic gate configuration. Although the earliest products used NOR gates, designers soon realised that, by sacrificing some flexibility in individually programming and reading memory cells, they could pack a lot more bits into the same area using a NAND gate configuration with serial interconnections. Today, almost all the modules produced are NAND Flash.

A Flash MOSFET memory cell



Flash uses an additional 'floating gate' in a transistor to store a charge, indicating a 1 or a 0

Buying products

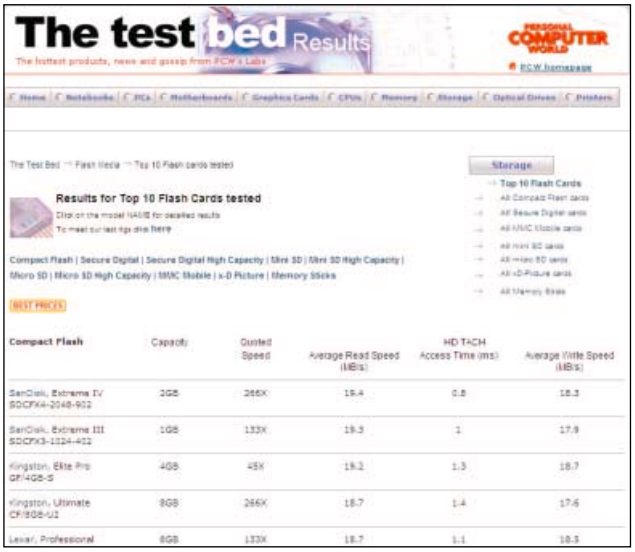
Buying Flash products can be a confusing and intimidating process. It's a bit like buying gas and electricity; there are often so many poorly explained options it can be hard to compare products in order to make a purchase decision.

Flash memory products are differentiated by six things; the physical format of the memory (SD card, Memory Stick, Compact Flash and so on), the chip type used for the memory, read and write speeds, added value features such as bundled software or built-in encryption for business use (a fairly recent innovation) and finally the two attributes uppermost in consumers' minds, storage capacity and price.

Price considerations are often connected with the decision on whether to buy a recognised brand name, a cheaper 'rebrand', or a no-name or 'value' option. Buying very cheap memory is often a false economy, and its worth very much depends on the value that you place on the data you want to store.

Identifying the type of memory you want, for example USB stick or CF card, is usually self evident, however you do have to be careful when purchasing online, since some vendors' descriptions can be poorly worded; we've explained the pros and cons of the different formats on page 49. As far as chip type is concerned, for practical purposes, all Flash on the market today is NAND gate based so it's not something you really need to worry about when you're shopping.

PCW's labs site maintains a database of test reports on Flash media of all types.



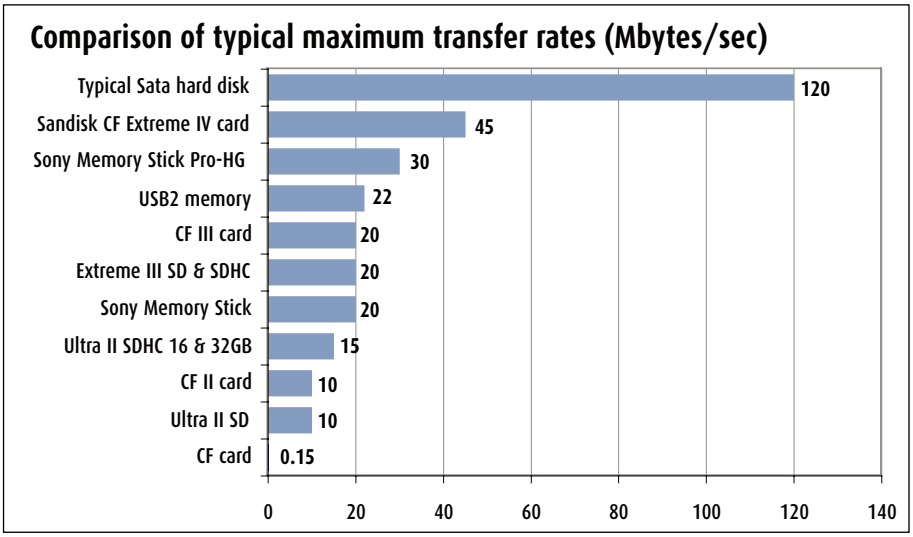
Making sensible Flash buying decisions is partly about knowing the capabilities of the digital device into which you're going to be plugging the memory. For example, it may not be worth buying the fastest CF card if the camera you're going to plug it in to does not support fast (Ultra DMA) memory access. In general, when buying a new super-fast Flash card, to avoid disappointment, it's well worth checking on the maximum transfer rate supported by your digital devices. Check to make sure they support all the sizes – older devices may not work with larger capacity cards, or may need their firmware updated first.

Flash 'speed ratings'

Although consumers don't tend to think about it, Flash 'speed' or transfer rate is quite important. One of the most annoying things commonly voiced about digital cameras is that they don't respond quickly enough, so you miss that perfect shot. And when using Flash for file transfer and backup, nobody likes waiting for lengthy file transfers to complete.

Manufacturers tend to describe all their Flash products as 'blazingly fast' and to indicate actual transfer rates in inconsistent ways. Major player Sandisk just uses descriptive product range names; Extreme, Ultra and so on, while Kingston Technology and others use a relative 'X' speed number system as well as the name. Like CD and DVD drives this is based on the supposed speed of the first-generation product. 1X is taken to be 150Kbytes/sec or 0.15Mbytes/sec, which is, coincidentally, also the speed of a 1X CD-Rom drive.

To help you cut through the marketing spin, *PCW*'s labs maintains an online database of Flash memory tests (using the HD Tach benchmark) at **www.reportlabs.com/testbed/version1/flashstorage1/flashtop10.php**. We've found that even the fastest don't give average transfer rates of much more than about 20Mbytes/sec, which is the limit of the fastest USB2 card readers rather than the cards. Some Firewire-based card readers claiming 40Mbytes/sec transfers are available but at the time of writing these only support CF cards.



Longevity

The longevity of Flash memory is something that vendors are extremely coy about, and you'll have a hard time finding any lifetime figures on their websites. However, various industry observers have published their own estimates of Flash lifetime when used as a hard disk. This application is probably the most stressful possible and, assuming minimum write/read cycles of between 100,000 (a figure often used by the chip makers) and two million, the calculated lifetime was between 50.74 (research by **www.storagesearch.com**) and 12.9 years (Bit Micro).

In theory, since the rate of use is much lower in digital cameras and general file transfer duties, Flash memory in those applications should last a good deal longer. With repeated insertions and removals it's more likely that the connectors might start to fail before the memory does. ↘

The maximum data retention time between when Flash is programmed and data is read is also of interest – that is, how long before you turn on a device and find that it has forgotten what you stored. Kingston Technology for example, rates its memory for 'up to' 10 years' retention under normal use. These numbers are impressive and compare very favourably with other methods of non-volatile storage.

The major brands

Flash memory cards are a high-volume, commercial product, so it's easy to see which the major brands or wholesalers are, but much more difficult to pin down is who makes the chips, outer card casings and performs the card assembly for those brands. Memory has been a steady cash cow for Japanese manufacturers and Toshiba, Matsushita and Fujitsu make large quantities of Flash chips. However, the Korean manufacturer Samsung Electronics (number one with 41.2 per cent market share) and Hynix Semiconductor (in third place) now dominate the market. Toshiba, inventor of the technology, is currently number two with 22.5 per cent market share, though it recently announced big expansion plans.

In the UK, memory specialists Kingston and the US company Sandisk (partners with Toshiba, **www.sandisk.com**) are the two biggest brands, and Qmemory, Transcend and Sony are also well known. You will often see own-branded cards supplied with big-brand digital cameras, but these are often manufactured by Sandisk or Toshiba.

Flash prices

With hard disk storage it's possible to analyse the cost per gigabyte and find a 'sweet spot' where drives of a particular capacity offer the lowest cost per GB. With Flash memory the cost per GB is a bit harder to analyse because it varies a lot depending on the speed too. There's also a smaller range of capacities to choose from, with just 1, 2, 4 and 8GB capacities in many ranges, but a larger selection of types.

Analysis of USB Flash memory device prices shows that the price per GB ranges between £3 and £19. For CF cards the range is £6 to £20 and for SD it's £6 to £18.

Flash devices with an unusually high price per GB tend to include some form of added value in addition to the memory. That might be bundled software such as backup, or data-recovery software, or extra hardware abilities, such as built-in encryption or SD cards with fold-out USB connectors. At the top end of the market, there are even products such as the Safeboot Phantom (reviewed in *PCW* Business section, March 2008, see **www.pcw.co.uk/2206787**), which incorporates a fingerprint scanner. If you do find something that looks suspiciously cheap, be cautious – it could well be a fake (see the box, right).

Flash types in depth

NAME	ACRONYM	FORM FACTOR (MM)	DRM SUPPORT	MAX CAPACITY (APRIL 2008)
Compact Flash I	CF-I	43x36x3.3	None	64GB
Compact Flash II	CF-II	43x36x5.5	None	64GB
Memory Stick	MS	50x21.5x2.8	Magicgate	128MB
Memory Stick Duo	MSD	31x20x1.6	Magicgate	128MB
Memory Stick Micro M2	M2	15x12.5x1.2	Magicgate	8GB
Memory Stick Pro Duo	MSPD	31x20x1.6	Magicgate	16GB
Memory Stick Pro-HG Duo	MSPDX	31x20x1.6	Magicgate	4GB
MicroSD Card	microSD	11x15x0.7	CPRM	2GB
MicroSD Card High Capacity	microSDHC	11x15x0.7	CPRM	12GB
MiniSD Card	miniSD	21.5x20x1.4	CPRM	4GB
MMCmicro Card	MMCmicro	12x14x1.1	None	2GB
Multimedia Card	MMC	32x24x1.5	None	8GB
Reduced size Multimedia Card	RS-MMC	16x24x1.5	None	2GB
Secure Digital Card	SD	32x24x2.1	CPRM	32GB
Secure Digital Card High Capacity	SDHC	32x24x2.1	CPRM	128GB
Smart Media	SM/SMC	45x37x0.76	None	128MB
XD-Picture Card	XD	20x25x1.7	None	512MB
XD-Picture Card (Types M & H)	XD	20x25x1.7	None	2GB

This 64GB SSD from Crucial is in a 2.5in Sata enclosure, making it a drop-in replacement for a standard hard drive

The future of Flash

With the introduction of small computers using Flash-only storage like Asus' Eee PC and the massive MP3 player and digital camera markets, the future looks very good for Flash memory. It's now starting to appear in housings that mimic traditional 2.5in notebook hard drives for drop-in replacement, such as the prototype 128GB Solid-State Drive (SSD) shown by Taiwanese manufacturer A-data (**www.adata.com.tw**) early last year and the 64GB Crucial SSD. Apple's Macbook Air is already available with an SSD option, and the Lenovo Thinkpad X300 is only available with a 64GB SSD.

As time goes by the idea of using Flash memory for bulk storage begins to look more and more attractive. It's small, simple, rugged, low power and perhaps rather more reliable and long lasting than people often think. At the moment, compared to hard disks, the disadvantages are that capacities still can't keep up with the ever-growing hard disk drive, it's not as fast, and the cost per GB is relatively high. Today an external 500GB hard drive costs well under £100, which works out at only 20 pence per GB or less. By comparison, typical Flash cards cost between £3 and £20 per GB.

Inevitably though, in the future prices will fall, capacities and speed will rise, making Flash memory a more attractive alternative to mechanical hard drives. **PCW**

Fake Flash

Flash memory is an obvious target for counterfeiters because it's small and easy to ship, it sells in high volume with a reasonable margin and it's relatively easy to copy the labelling and case designs. Copies are only made of the high-value brand names and they're often so good that it's hard to tell the genuine article when they are compared side by side. However, although the fakes may work they are usually nowhere near as reliable as the genuine article.

A simple way to fake Flash is to buy low-cost, obscure brand cards and replace the labels with a copy of those from a top brand. To steer clear of fakes, we recommend you always buy your memory from a reputable dealer, and avoid auctions or suspiciously cheap vendors.

Flash forms

A selection of four different brand CF Cards in a range of capacities

Over the years Flash memory chips have appeared in more than 20 memory card formats. Only a few remain – USB stick, Compact Flash, Secure Digital and Sony's Memory Stick are the survivors, along with the proprietary formats of major game console vendors, and mobile phone SIM cards.

Smart Media

Now almost defunct, Smart Media was the first card memory released with NAND Flash. It often had only a single flash chip mounted in a very thin, flat card and no built-in controller. This led to address compatibility problems as capacities increased and Smart Media ceased production with 128MB cards. With its limited connections it's also slower than the competing Compact Flash card. There are many digital cameras still in use that use Smart Media memory.

USB memory sticks

USB Flash memory, also sometimes referred to as thumbdrive, Jumpdrive (a Lexar marketing name) or a USB key, is by now familiar to most people and has largely usurped the floppy disk. It's ideal for temporary backups and file transfer, but USB keys stick out when plugged in so don't suit semi-permanent installation, unlike most of the other Flash formats. The connector is simple, but transfer rates are limited by the USB port, so a USB2 memory key will run slowly in a USB1 port. Unlike Smart Media, they include a controller chip to perform maintenance duties and filing system conversion.

Above: Two USB memory sticks, one bearing a promotional branding

One of the larger forms of Flash, USB sticks are sometimes fitted with write-protect switches and almost always have an activity light. They're typically available in capacities from 256MB to 32GB and with transfer rates up to 22Mbytes/sec.

Besides capacity and speed, the price of USB Flash is determined by features such as metal cases, extras such as encryption or displays showing usage.

Compact Flash (CF)

Compact Flash, based on the PC Card and introduced by Sandisk in 1994, is one of the oldest Flash card hardware configurations and, although the casing is relatively bulky, the CF card has proven to have great staying power. Along with Smart Media, Compact Flash was a success in digital cameras, where it is still commonly used. CF is made in two types; Type I is 3.3mm thick and Type II 5mm thick. Type II is used for micro hard drives and is now quite rare. CF also comes in four speeds; the original CF, CF High Speed (also known as CF+ or CF 2.0 or II) with a typical 10Mbytes/sec read and 9Mbytes/sec write, CF 3.0 (or III) with a typical 20Mbytes/sec read and write and CF 4.0 (or IV) with a typical 40Mbytes/sec read and write.

Although the package size and connector for Compact Flash add to the manufacturing cost, the connector means CF has a wide, parallel, data bus and this is partly why the popular format has remained. It allows some CF cards to support Ultra Direct Memory Access (UDMA) for a 300X (45Mbytes/sec) transfer rate, providing the device they are plugged into supports UltraDMA, which some high-end digital cameras now do. In theory, revision 4.0 of the standard supports up to 133Mbytes/sec, and seek times for DMA-capable CF cards can beat those of a hard drive. Capacities range from 32MB up to 64GB and the cards themselves include a controller chip to perform wear mapping and filing system conversion.

Secure Digital (SD)

Secure Digital or SD cards and the associated formats miniSD, microSD, SDHC (SD High Capacity) miniSDHC and microSDHC, are perhaps today's rising stars of Flash. SD memory is physically small and light, so it's eminently suitable for use in handheld digital devices such as pocket cameras. The name Secure Digital is used because the original formats – SD and SDHC – are fitted with a tiny mechanical write-protect slide switch. High Capacity, as in SDHC, refers to cards with capacities over the 2GB partition size limit imposed by Fat; these 'HC' devices use the Fat32 format instead.

The mini and micro cards don't have a switch, but can be inserted into an adapter that does, and allows them to fit SD slots.

Transfer rates for SD are 10Mbytes/sec for the low-capacity, minimum-specification cards, up to 20Mbytes/sec for the highest specification cards.

Sony Memory Stick

Memory Stick is a proprietary Sony product, designed to lock users of their devices into using only this format. There are five flavours of Memory Stick; the original, the Memory Stick Micro, the MS Duo, the MS Pro Duo, and the MS Pro-HG Duo, with a maximum capacity of 32GB. According to Sony the newer MSmicro is designed for use in mobile phones and the company no longer supports the original Memory Stick.

The MS Micro is available in 512MB, 1, 2 and 4GB capacities and the MS Duo is available only in 128MB. The MS Pro-Duo is available in 512MB, 1, 2, 4 and 8GB capacities. All three have a maximum transfer rate of 20Mbytes/sec. The MS Pro-HG Duo is available in 1, 2 and 4GB capacities with a maximum transfer rate of 30Mbytes/sec.

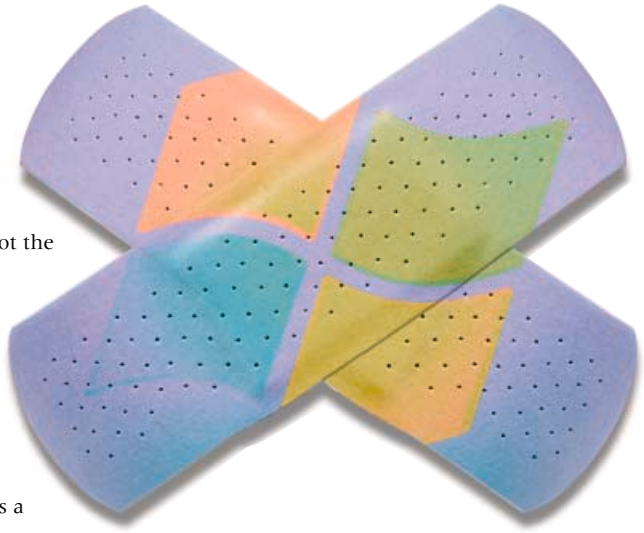
Memory Stick is one of the few removable Flash memory formats that supports DRM (Digital Rights Management), in the form of Sony's Magicgate.

● For more information see the 'Flash types' table on previous page.

From left to right: miniSD card, miniSD adapter, 8GB SDHC card and 16GB SDHC card

Vista's aid package

Vista's first service pack may be welcome, but don't expect too much, and do your homework first, warns Kelvyn Taylor



The last major operating system service pack from Microsoft, Service Pack 2 (SP2) for Windows XP, released in 2004, was an oddball. Rather than a simple rolled-up collection of patches and hotfixes, it introduced some major new features and functionality. So much so, in fact, that we produced an illustrated step-by-step guide to the new additions (**www.pcw.co.uk/2045914**).

But whatever you might have heard, the new SP1 for Vista is not in the same league. It doesn't include any major new changes to functionality or the user interface, and one of its real functions is to harmonise Vista's core files and the newly launched Windows Server 2008, which shares the Vista code. Microsoft hopes this will help convince enterprise users that Vista is now mature enough for them to start an upgrade cycle.

Some hiccups Microsoft has identified since it started beta testing SP1 back in 2007 mean the rollout has not been quite as simple as it had hoped. In this feature we're going to look inside SP1 to see what makes it tick, and highlight why you should think before rushing to the Windows Update site to download and install it. Or if, as is more likely, by the time you read this it has already been installed on your system automatically, this feature should help you spot the well-hidden changes.

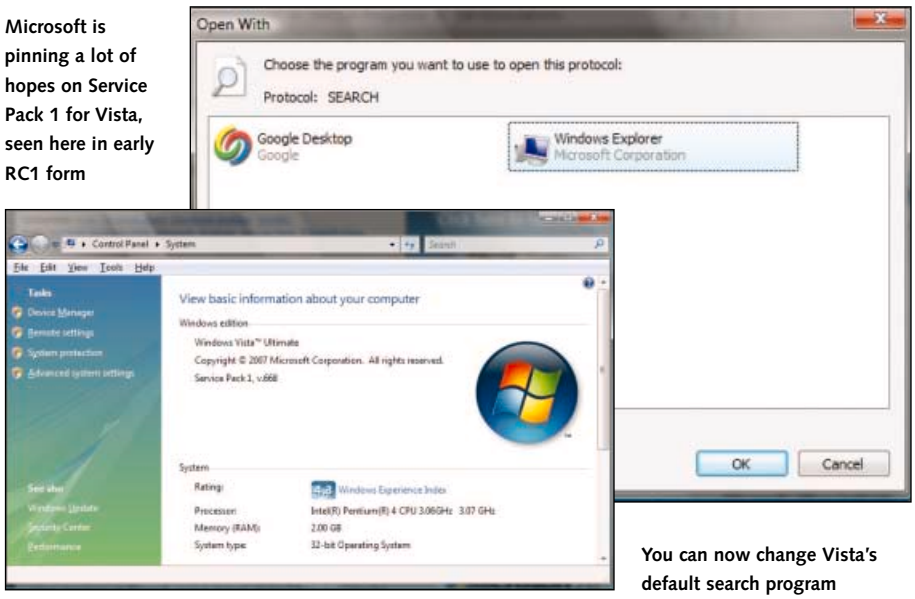
Small but powerful

Let's put to rest the various myths surrounding the size of Vista SP1. Microsoft, for all its failings, is well aware that minimising the size of service packs is in its interest if it wants a high uptake. And yes, it still does realise that not everyone has broadband – if you've visited the Microsoft downloads site (**http://downloads.microsoft.com**) you'll notice it still gives you estimated download times for dial-up connections.

If you download SP1 via Windows Update it's approximately 65MB. This represents a couple of hours via 56Kbits/sec dial-up or 15 minutes using a 1Mbit/sec ADSL connection. Compared to the 250MB behemoth that was XP SP2, it's a tiddler.

Where the confusion has arisen is that the Windows Update version is a smart package, in that it only downloads the components and patches needed for your system.

The standalone versions of SP1, on the other hand, need to include support for the different language versions of Vista. There's a 450MB five-language version and a full 36-language version that's a chunky 550MB. You can download these direct from the Microsoft Downloads site. These standalone versions are aimed chiefly at IT administrators who want to centralise and control the rollout of SP1 across a large number of PCs.



Microsoft is pinning a lot of hopes on Service Pack 1 for Vista, seen here in early RC1 form

You can now change Vista's default search program

Things can only get beta

A few months ago we previewed the release candidate of SP1 (*PCW*, March 2008) and since then not much has been changed. The main change is in the installation, which for the beta involved a long and involved process to ensure some prerequisite hotfixes were installed before SP1 itself was downloaded and installed.

For the final version of SP1, this procedure shouldn't be necessary as the three patches should have been downloaded (if applicable to your version of Vista) via the normal Windows Update process in the first couple of months of 2007. You can check whether these have been installed by going to Windows Update in the Vista Control Panel and clicking the 'View update history' link. The relevant patch numbers to look for are KB935509 (only required on Windows Vista Enterprise and Windows Vista Ultimate), KB938371 and KB937287.

But however much Microsoft has tried to make the update painless, Vista SP1 hasn't got away scot-free. In late testing it was discovered that badly written drivers for certain products (believed to include some audio, video and network cards) could cause problems during an SP1 install. So Microsoft had to come up with a way around this, and it has done so via Windows Update. This will check whether the rogue drivers are installed

on your PC, and if they are SP1 won't be downloaded to your PC until the manufacturers have come up with fixed drivers and made them avaialable via Windows Update. It's hoped that these will have been sorted out by the time you read this in mid-April, but if your Vista PC hasn't yet automatically installed SP1 via Windows Update, that could be the reason.

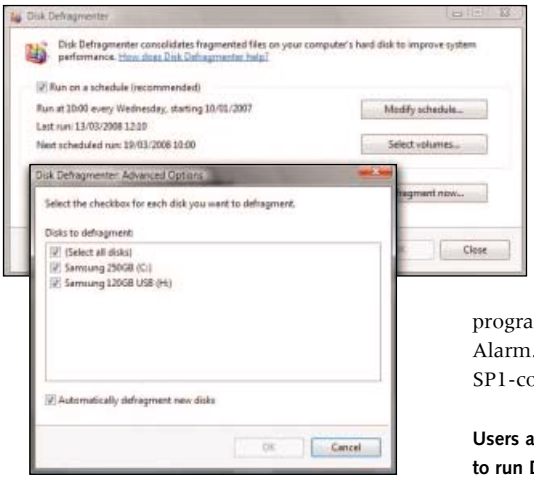
If you fancy overriding Windows Update and installing SP1 via the standalone package, you can, but be aware that doing it this way won't check your PC for suspect drivers and you could end up causing yourself more grief than necessary. Our advice to all but the most confident users is to leave Windows Update to do its thing.

If you're one of the adventurous users who installed the public beta of SP1, you'll need to uninstall it via Control Panel in order to get access to the final version.

What's in it for me?

Enough of the mechanics of how to get SP1; what exactly does it offer end users? Even though the offical guide to what's changed runs to 20 pages, probably the only thing a casual user might notice is the Search item on the right-hand side of the Start menu has now disappeared. The Search box is still there, and Search still works the same way. But if you want to load the Instant Search window you now need to press Windows key & F. The reason for this is that Google protested that the deep integration of Windows Search in Vista disadvantaged third-party desktop search products. Microsoft acquiesced remarkably quickly on this, and now you can choose your own default program for the Search protocol. This choice will replace the Search provider on a system-wide basis, so pressing Windows key & F will now launch your preferred search tool.

In terms of performance, Microsoft isn't claiming any major speed improvements apart from fixing a bug in file copying. Whereas before Vista would sometimes sit and think for ages while trying to calculate estimated copy times, now the whole process of copying between folders or via a network is noticeably quicker. Our Hands On Networks columnist Alan Stevens looked at this aspect in detail in the April 2007 issue of *PCW* (see **www.pcw.co.uk/2185620**).



Users are given the ability to choose which disks to run Disk Defragmenter on

Advanced users will notice that the Group Policy Management Console (GPMC) has been removed, and typing gpedit.msc in a Run box will now just launch the Local Policy Editor. A new version of GPMC will eventually be available from Microsoft.

You might think you've found some extra memory if you have 4GB of Ram installed, as Vista's System Properties will now report the total amount of Ram installed rather than the amount available to the OS.

Typical of the many subtle tweaks in SP1, the Disk Defragmenter now lets you choose which volumes to defragment – previously it would automatically run on all disk drives.

Another disk-related improvement comes if you use Vista's Bitlocker drive encryption system (only available in Vista Ultimate and Enterprise editions). SP1 now adds the ability to encrypt non-system disks.

Application compatibility

There's been an outcry in the media about some applications not working or being blocked by SP1, notably some anti-virus and firewall programs such as Bit Defender and Zone Alarm. Almost all these programs have SP1-compatible updates or patches available for free. The full list is available as article 935796 in the Microsoft Knowledgebase (**http://support.microsoft.com**).

Although SP1 contains some new compatibility fixes for applications, it won't fix programs that are fundamentally incompatible with the way Vista works.

Reliability improvement

Microsoft claims SP1 will improve reliability, something that's very difficult to assess in these early days. However, during our four months' experience of running the RC1 version we have noticed our test system – which is in daily use – hasn't experienced any Windows OS failures, as monitored via the Vista Reliability Monitor. Before SP1 we were getting at least half a dozen OS freezes a month, so Microsoft certainly appears to be doing something right.

To install or not to install?

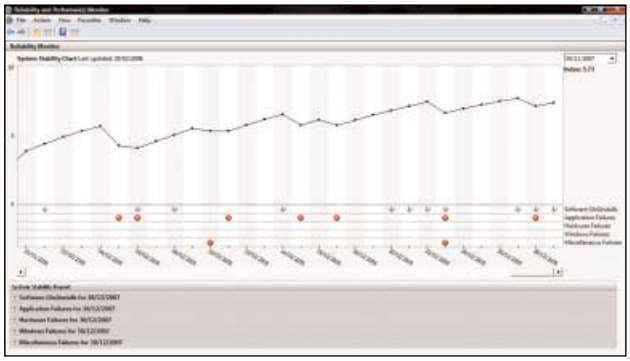
The final decision to install Vista SP1 or not is left to the user – Microsoft won't force the update on anyone who turns off automatic updates or declines the download. But on balance we'd say there's little reason to avoid it, as it certainly patches a good few holes and doesn't do anything particularly controversial. But for those who do want to install it, we would definitely recommend doing it via Windows Update if possible to avoid the chance of messing up your PC due to one of the known rogue drivers. **PCW**

Slipstreaming slips aways

One thing you won't be able to do with SP1 is 'slipstream' it. Slipstreaming is a way of incorporating the files from a service pack (or other patches and hotfixes) into a new installation CD or DVD. With Windows XP, this was a great way of saving you time when you have to reinstall XP from scratch.

But with Vista, the installation disc contains an image file of an installation rather than a collection of installation files. If you try to slipstream Vista SP1, you'll end up with a corrupted installation. There is a workaround, called reverse integration. You install Vista, then SP1, then create a new Vista install image from this installation. The problem is it's not a simple process for home users (see **http://tinyurl.com/37lfdw** for more details). Even the slipstreaming tool Vlite can't reliably get around this, so we'll have to wait for Vista SP2 (whenever that is), at which time Microsoft says slipstreaming will be possible.

New retail copies of Vista will incorporate SP1, so if you're planning on buying a copy, make sure you check that it's the SP1 version.



We haven't seen any Windows OS failures since installing SP1

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REVIEWS

HEAD FOR THE HILLS

If you don't own a sat nav, you can't fail to have seen them clogging up the aisles of stores across the country. But there's much more to GPS than simple A-to-B in-car navigation and this month we take a look at the latest outdoor GPS devices on the market. Although there aren't a huge number of manufacturers at the moment, having tried out a few devices myself I highly recommend you give one a go. These pocket wonders let you explore the countryside like never before and some use instantly recognisable Ordnance Survey maps. They're also great for use in urban areas and, unlike the so-called pedestrian modes found in many in-car sat navs, will help you find your way through a town centre on foot, making use of all the various footpaths and bridleways. Find out which model scooped our Editor's Choice award on page 96.

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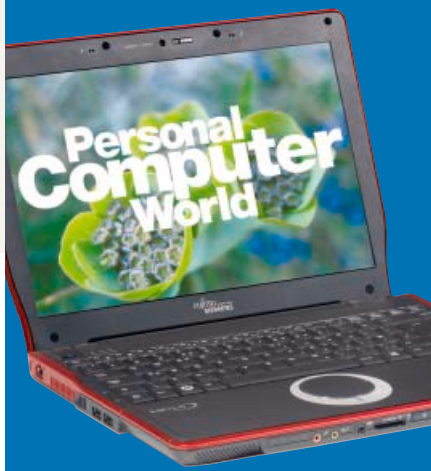
Prices include Vat unless otherwise stated

OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.
Recommended: A product that combines great features, usability and value for money.
Great Value: Not the best in class, but a product that has superior features and performance for the price.
Best Buy: The best product in its class in terms of performance, features and value for money



'Fujitsu Siemens' Amilo Si 2636 has a small display that keeps down the weight, and the red metallic strip makes it stand out'

Read the review on page 57

DESKTOP PC

Cyberpower Gamer Infinity SLI GX2

A powerful gaming PC featuring Nvidia's latest dual-GPU graphics card

The centre piece of this PC is undoubtedly the Geforce 9800GX2 graphics card – Nvidia's answer to the ATI Radeon HD 3870X. It's currently the fastest graphics card in the world, has the biggest price tag to match (£420) and draws more power than any other card (the whole system drew 226W while idling).

The Geforce 9800GTX, 9800GTS and 9800GX2 are all based on Geforce 8 technology, specifically the 8800GTS (G92 core). The 9800GTX and 9800GTS have higher clock speeds than the 8800GTS, while the 9800GX2 has a slightly slower GPU speed (600MHz) but compensates for this by sandwiching two G92 cores together with Nvidia's SLI technology.

With a whopping 1GB of 2GHz GDDR3 Ram, it scores higher than any other card in benchmarks optimised for SLI. But, as always, the gains are never double that of a single card and, where software isn't optimised for SLI, the 9800GX2 may score less than a single 8800GTS. World in Conflict, for example, showed little benefit from having two GPUs – the Cyberpower PC achieved 46fps (frames per second) at 1,920x1,200 with high settings enabled, which is a measly 14 per cent faster than Arbico's £900 base unit reviewed last month (**www.pcw.co.uk/2211938**) which had a similar processor and a single Geforce 8800GT graphics card.

PC games run at high settings and excellent frame rates at the included 22in Viewsonic VX2235wm monitor's native 1,680x1,050 resolution, though. A 24in model, perhaps not too big an ask for a £2,000 PC, with a 1,920x1,200 resolution would be able to take advantage of the 9800GX2 far better in some games, plus 1,080p HD films would look crisper.

The 9800GX2 has an HDMI output, so the Gamer Infinity can output to an HD TV, but it won't output sound because Cyberpower doesn't use the 9800GX2's internal S/PDIF port. A Creative Soundblaster X-Fi Extreme Gamer soundcard will output sound, though, to the supplied Inspire T7900 speakers. These speakers are seven years old now but still provide a great 7.1 experience.

A dual-core Core 2 Duo E8400, based on Penryn architecture, with a 3GHz clock speed, and 2GB of DDR3 Ram are the Gamer Infinity's building blocks. Cyberpower overclocks the CPU to 3.6GHz for extra oomph by increasing the front-side bus (FSB) from 1,333MHz to 1,600MHz and increasing the available voltage to 1.425V. Other E8400s may get a different tweak depending on the CPU's unique voltage ID.

Our CPU registered a cool 44°C after a day's work, courtesy of an excellent CPU suction cup and radiator system to expel hot air from the chassis.

An Nforce 790i motherboard is another faultless inclusion. Successor to the 780i, the 790i adds support for DDR3 Ram and 1,600MHz FSBs, but features the same excellent connectivity and debug LED. Other system goodies include a Wifi card, a multiformat card reader, Vista Home Premium, a top Logitech gaming mouse and keyboard, 10,000rpm Raptor hard disk and two 500GB hard drives for acres of digital space.

Everything fits into a Coolermaster Cosmos S case. We had a few problems with it, starting with two inactive front USB ports, which weren't connected due the limitations of the motherboard. There's also no hardware reset button.

The Cosmos S has a new grilled side panel but no swing-out door like its predecessor the Cosmos 1000, instead relying on two flaps at either edge on the front to hide the 5.25in drive panel catches. One of these metal flaps was broken, but Cyberpower says it can easily fix this. We also found a loose screw from the graphics card rattling inside. However, Cyberpower sensibly stuffs the case with bulbous air-tight plastic bags that act as an airbag during transportation so nothing gets damaged.

Cosmetically, the grilled side panel is used to good effect, with Cyberpower fitting two cold-cathodes so red light spills out of it (an external light switch is fitted if you get tired of this).

There are a few little niggles with the Gamer Infinity SLI GX2 but, with exception of the 22in monitor, they're mostly rectifiable flaws. If you built a PC to this specification yourself, £2,000 wouldn't be enough to include a 24in monitor, so the Cyberpower is excellent value for money in that respect. The balance of the system is right if you're into playing Crysis and other new DirectX 10 games, since a 22in monitor's lower resolution makes good sense with these tough-to-handle games. *Emil Larsen*

Performance

PCmark05 **8,546**

0 4,000 8,000 16,000

3Dmark06* **17,067**

0 4,000 8,000 16,000

*Tested at 1,024x768 in 32-bit colour

Verdict

Pros Great for high-resolution gaming; top system performance; good keyboard and mouse

Cons HDMI audio not enabled; no reset button

Overall An astounding amount of power, a great look and oodles of premium extra features

Features	★★★☆☆
Performance	★★★★★
Value for money	★★★★★
Overall	★★★★½

Price £1,999

Contact Cyberpower 0800 019 0863 www.cyberpowersystem.co.uk

Specifications Intel Core 2 Duo E8400 (3.6GHz) • Nforce 790i Ultra motherboard • 1,333MHz DDR3 OCZ Ram • 22in Viewsonic VX2235wm • Coolermaster Cosmos S case • Geforce 9800GX2 1GB • 150GB 10,000rpm Western Digital Raptor hard disk • 2 500GB 7,200rpm Samsung Spinpoint T166 hard disks • Creative Soundblaster X-Fi Xtreme Gamer • DVD writer • 802.11a/b/g Wifi • Three-year RTB warranty

DESKTOP PC

Shuttle P2 3500G

Big on power, but small in size

USB, Firewire and audio ports are accessible via a flap at the front

This small form factor PC from Shuttle is branded a gaming machine but, at 6.9kg, weighs less than many big laptops. Its diminutive size has drawbacks if you intend to upgrade it (there is only one free PCI slot and one mini PCI Express slot) and it also costs a lot compared with bigger gaming PCs.

The P2 3500G is based on Shuttle's SP35P2 Pro barebone chassis, which uses Intel's P35 chipset. Shuttle pairs this chipset with just one PCI Express slot, unlike its X38 big brother, which makes it more affordable, but it retains most of the features and performance of the X38 to make it one of the best Shuttle barebones around.

Intel's low-end quad core – the Core 2 Quad Q6600 – is present, along with 4GB DDR2 800MHz Cas5 Ram and a 750GB hard disk. The included Windows Vista Home Premium 32-bit can only access 3.3GB of Ram – the 64-bit variant is not an option.

The CPU is Intel's G0 stepping, which has the same multiplier as Intel's expensive QX6850 CPU and means it's easily overclockable to 3GHz (often without a voltage increase) by simply flicking the front-side bus from 1,066MHz to 1,333MHz.

The 3500G's Bios didn't respond well to being overclocked, though, crashing when we used the auto-overclock options and booting into Windows at 2.4GHz even when the Bios claimed it was at 3GHz.

The Bios goes completely against tradition by referring to a millivolt offset rather than the whole of the voltage across the processor, but since overclocking invalidates warranties, only enthusiasts will be disappointed by the 3500G's intricate Bios.

Graphics are handled by an ATI Radeon HD 3870 with 512MB of 2.25GHz GDDR4 Ram, which is the fastest ATI graphics card with one GPU. It's not as fast as Nvidia's 8800GTS, which is a better card for the most serious gamers, but it does draw less power. Combined with the 80 per cent efficient 400W PSU, the total system drew 95W when idling – an outstanding result for a gaming branded system.

Performance was good throughout, scoring a beefy 8,597 in PCmark05, 7,699 in the CPU section and a decent 1,296 in Cinebench's multi-CPU test.

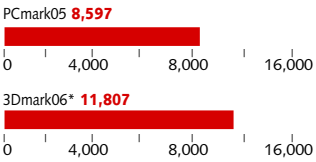
Where gaming prowess is concerned, the 3500G scored 20fps (frames per second) in our intensive DirectX 10 World in Conflict benchmark at 1,920x1,200, with high detail settings enabled. Only when we lowered the resolution to 1,680x1,050 and used medium settings was the game playable, averaging 46fps, so a 22in monitor is probably the P2 3500G's best companion.

The P2 3500G, like most Shuttle computers, does a good job of home theatre PC tasks. There's no remote control, but there is 802.11b/g Wifi fitted neatly inside the chassis. The back of the case presents a feast of ports, while three sleek, black front doors reveal a DVD writer, a multiformat card reader and a connectivity panel, respectively. The connectivity panel has a fingerprint reader, headphone and microphone jacks, a mini Firewire port and two USB ports, while a Speed-Link button gives one USB port networking functionality.

A USB cable is supplied, with a male plug either end, which, when connected to the Speed-Link-enabled USB port and another PC activates a 480Mbits/sec network connection between the two. It's hardware-driven, so there's no need to install any drivers on either system.

If you can stomach the £200 price compared with a bulkier Dell XPS gaming machine, and don't plan to overclock, then this is a list topper. *Emil Larsen*

Performance



*Tested at 1,024x768 in 32-bit colour

Verdict

Pros Speedy; lightweight; low energy consumption; great connectivity

Cons Expensive; Bios unclear in areas; unreliable overclocking

Overall A compact, efficient PC suited to middle-resolution gaming, but expensive compared with others

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price: €1,675.55 (£1,326.20 approx)

Contact Shuttle
http://eu.shuttle.com

Specifications Intel Core 2 Quad Q6600 (2.4GHz) • 4GB DDR2 800MHz Cas5 Ram • 750GB Samsung HD753LJ hard disk • Radeon HD 3870 512MB GDDR4 • 802.11b/g Wifi • Eight USB; Two Firewire ports • 7.1 surround sound • Optical digital in/out • Coaxial digital out • Vista Home Premium • 220x325x210mm (wxdxh)

ARCHOS TV+

Break free from TV schedules, with the ARCHOS TV+.
With up to 250GB storage, watch what you want, when you want, whether it's recorded from TV, streamed from your PC, or downloaded from the ARCHOS content portal. You can even surf the web* on your home TV. Who's in control now?

Have your say at Archos.com

* Optional plug-in required

ARCHOS
Entertainment *your* way

NOTEBOOK PC

NEC Versa S970

A fully encrypted hard disk so thieves can't get at your files

This is the first notebook to use Seagate's 120GB FDE (full drive encryption) hard disk. With encryption enabled, you must type in a password when you switch the laptop on. The security mechanism resides on the hard disk, so if someone removes the disk and sticks it in another notebook, they'll still need to know the password before data can be accessed – and that includes booting into Windows. It's a secure design and performance wasn't affected. NEC also fits a TPM 1.2 chip, which gathers your various passwords in a secure hardware chip.

Core system performance was very good, thanks to a 2.2GHz Core 2 Duo T7500 and 2GB DDR2 667MHz Ram, but its integrated graphics mean gaming is out.

The chassis is a little bland but has a reasonable selection of ports, including three USB ports, a Firewire port and a multiformat card reader. Some notebooks use a two-pronged aerial for Wifi connectivity, but Nec has a three-pronged version attached to its Draft-N Wifi card, resulting in great Wifi reception.

Less appealing is the 14.1in screen, which is dimmer than many other modern notebooks. It also lacks a webcam, has stiff trackpad keys and the spacebar sits next to a high plastic rim so your thumbs continually whack it when typing at a fast pace.

A large 5,200mAh battery powered it for three hours 28 minutes in the Mobilemark Reader test, which improved by 12 per cent with the ECO mode enabled (dims the screen and lowers CPU frequency).

If you need top-notch security this is the best in the business, but if you're after a solid workhorse the S970 is rather mundane. *Emil Larsen*

Verdict

Pros Excellent security; great battery life; good core system performance
Cons High keyboard rim; poor LCD brightness; no webcam; integrated graphics
Overall The hard disk is great, but the notebook has a bland construction and is physically flawed in areas

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★☆☆

Price £694

Contact NEC 020 8993 8111 www.neceurope.com
Specifications Intel Core 2 Duo T7500 (2.2GHz) • 2GB 667MHz DDR2 Ram • 14.1in display (1,280x800) • Intel GMA X3100 graphics • 120GB Seagate FDE drive • 3-in-1 card reader • 3 USB2 • VGA, S-video • DVD writer • 33x39x239mm (wxhxd) • 2.8kg •

NOTEBOOK PC

Fujitsu Siemens Amilo Si 2636

Fast processing power in a small, sleek package

For notebooks with Intel's Core 2 Duo processors, clock speeds below 2GHz have until now been the order of the day, certainly at the cheaper end of the market. Most of the faster processors are in the bulkier desktop replacements above the £800 mark.

Coming in a full £100 below that is the Fujitsu Siemens Amilo Si 2636, which contains a T8100 processor (clocked at 2.1GHz) and 2GB of Ram. It also has 1GB of Intel's Turbo Memory.

In our benchmarks, it achieved 4,423 in PCmark05 and 541 in 3Dmark06 – neither is groundbreaking, but indicates it's more than capable of most office tasks.

There's no graphics card, only the onboard Intel GMA X3100, so graphics and games performance isn't up to much, while the screen measures 13.3in with a resolution of 1,280x800. The small display helps keep the notebook's weight down to just 2.6kg, while the red metallic strip around the sides really makes the Amilo Si 2636 stand out.

It has only two dedicated USB ports, which might be a problem for some, but there's an eSata socket (doubling as a third USB port) along with an HDMI port (there's no VGA or DVI connector, nor is an adapter supplied). There's a memory card reader and mini-Firewire port along with headphone and microphone connections on the front. It also features Bluetooth, 802.11n and a slot-loading DVD writer.

The only real flaw we found was the circular trackpad and buttons, which take some getting used to. The keyboard is also a little shallow, but the design is otherwise impressive. Battery life was acceptable, but nothing special at two hours, 12 minutes.

Despite some minor flaws, Fujitsu Siemens' Amilo Si 2636 is a good workhorse notebook with a stylish design and a reasonable price. *Anthony Dhanendran*

Verdict

Pros Good looks; fast processor; large hard disk
Cons Poor graphics; bad trackpad
Overall Good performance and lots of features from a decently priced notebook

Features	★★★★★
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price: £699

Contact Fujitsu Siemens 0800 004 003 www.fujitsu-siemens.com
Specifications Intel Core 2 Duo T8100 (2.1GHz) •2GB Ram •1GB Intel Turbo Memory •13.3in screen •Intel X3100 graphics •250GB hard disk •DVD writer •802.11n wireless •3 USB Ports •HDMI, Firewire, eSata •Bluetooth •Expresscard slot •Webcam •Windows Vista Home Premium •2.3kg •One-year C&R warranty

SAT NAV

Medion Gopal P4425

A feature-packed navigator with solid performance

Despite taking a back seat to more established brands like Tomtom and Garmin, we've been impressed with the solid performance on the road and range of features of the Medion's navigators. The P4425 offers a few improvements over previous models, which suggests the company is looking to build on its recent success.

The slimline chassis and gloss-black finish looks good, while its lightweight design, customisable button and dedicated volume controls on the exterior are also impressive. Full maps of the UK and Europe are installed as well as built-in Traffic Message Channel and speed camera alerts and Bluetooth. The list doesn't end there though, multimedia features such as an MP3 player, photo viewer and video player give it added appeal, and you'll find Berlitz travel guides and even an FM transmitter to send tunes or directions to your car stereo. It also includes a fingerprint reader that you can use for security as an alternative to entering a passcode.

Previously we've been impressed by Medion's straightforward navigation, easy-to-access menus and customisable display, and nothing has really changed here. We weren't quite as bowled over as we have been in the past though; the maps are starting to look a little bland and uninspiring, and you'll have to spend some time tweaking the display to get a decent amount of information on screen.

While capable, the general en-route navigation is not nearly as easy to follow as that on the Panasonic Strada that we reviewed in the May issue of *PCW* (**www.pcw.co.uk/2212637**).

Despite these niggles, along with the fact that there's not a lot of additional room on the SD card to add your own digital media, the P4425 is still a capable navigator and, if you've the patience to configure it correctly, it won't steer you wrong. *Paul Lester*

Verdict

Pros Decent performance on the road; impressive array of additional features; good value for money
Cons Maps are a little uninspiring; can take a while to configure properly
Overall It could be a little more straightforward to use, but it's another solid effort from Medion

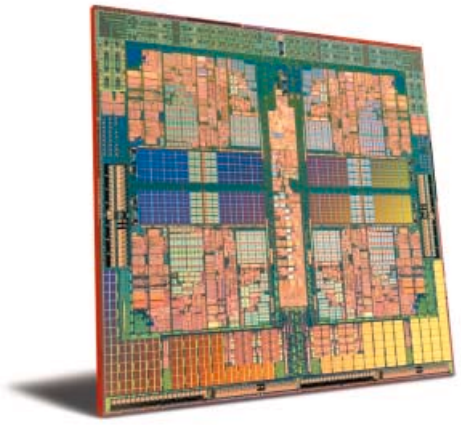
Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★★☆
Overall	★★★★☆

Price £249.99
Contact Medion www.medion.co.uk
Specifications Atlas III 396MHz processor • 512MB integrated memory, 2GB SD card • UK and Europe maps • 4.3in widescreen display • Free RDS TMC and speed camera locations • Bluetooth • MP3 and video player • 124x17x81mm (wxdxh) • 186g

CPU

AMD Phenom X4 9850 Black Box Edition

A higher clock speed than the original release and no TLB bug



The original 9000-series Phenoms received bad press since, at launch, AMD admitted the Phenom's translation lookaside buffer (TLB), which maps virtual addresses onto physical addresses, was faulty in the L3 cache. The upshot is a 9000-series can crash when all four cores go to 100 per cent load.

Initially we recommended holding off Phenoms until further investigation, but we can now confirm the bug only affects server applications. We've not found a consumer benchmark or program that can cause the Phenom to crash. Despite this, AMD has released its 9050-series of Phenoms, which don't have the TLB bug and the bad press associated with it.

At 2.5GHz, the X4 9850 Black Box edition is the fastest TLB bug-free Phenom and 100MHz faster than AMD's previous best, the Phenom X4 9700. The Hypertransport 3.0 link and memory controller are increased to 4GHz (full duplex) and 2GHz respectively (a Phenom 9750/9550's Hypertransport link will only run at 3.6GHz, memory controller at 1.8GHz).

Like all Black Box edition processors, the CPU multiplier is unlocked, giving it maximum overclocking potential. AMD's Overdrive utility lets you do this in simple fashion, but we found it unstable for serious performance gains. Using the Bios we overclocked the 9850 to 3.1GHz with a 0.225V core increase.

At 2.5GHz the 9850 is slower than Intel's slowest 2.4GHz Core 2 Quad, the Q6600, by four per cent in PCmark05's CPU test and by six per cent Cinebench 9.5. When overclocked to 3.1GHz it sped past the Q6600 and the QX6700, scoring 9,172 in PCmark05.

If you're building a home-theatre PC, pairing this Phenom with Gigabyte's 780G motherboard (see our group test on page 113) makes a great value package. But for high-end PCs, Intel remains king. *Emil Larsen*

Verdict

Pros Best Phenom overclocking potential; no TLB bug; good upgrade for AM2 Athlon X2 systems
Cons Higher power consumption than Intel quad cores; more expensive and slightly lower performance than Intel quad cores
Overall If you must buy an AMD processor, this is the best out there, but Intel's CPUs still hold most of the aces

Features	★★★☆☆
Performance	★★☆☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price: £170
Contact AMD www.amd.com
Specifications Socket AM2+ • 2.5GHz • 512KB L1 cache • 2MB L2 cache • 2MB L3 cache • 2GHz memory controller speed • 1,066MHz memory support • 4GHz Hypertransport 3.0 • 125W TDP

Colour printing for less

Some small businesses may still be concerned about the cost of colour printing, but nowadays high quality colour is possible on a tight budget

In HP's tests, the Officejet range used less ink per page than comparable lasers - giving better value

Small businesses and large businesses print the same kind of materials – the only difference is how many. Whether producing memos, reports or marketing materials, each and every business needs to know that they can count on trouble-free printing. So it's good to know that businesses of any size can enjoy affordable colour printing. Why should affordable colour printing only be available to medium and large businesses?

With recent advancements in inkjet technology HP can offer businesses top quality colour printing at a lower running cost than competitive laser printers, allowing micro and small businesses to print colour affordably. The new range of HP Officejets are optimised for companies that print up to 100 pages a day, helping them achieve substantial savings on each page printed compared to laser printers in the same price range. And all this without sacrificing essential business features such as fast print speeds, wired and wireless networking and HP's proven reliability and ease of use.

HP's Officejets match laser printers on quality in colour and black and white prints

Half the running costs of laser

Changing ink cartridges frequently is a hassle that most companies would like to minimise. That's why HP Officejet ink cartridges now come in special XL packs that last longer and offer a lower cost per page.

HP internal testing using laser all-in-ones currently on the market for under £375 and laser printers under £150, show that inkjet HP Officejets print colour at 50% less per page (CPP) than lasers and an HP Officejet 88 XL black ink cartridge will print up to 2,450 pages before it needs to be changed.

Inkjet matches laser for quality

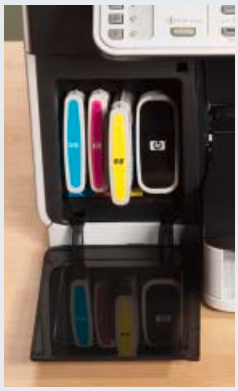
When it comes to print quality, businesses still think of laser as the only professional printing system, but HP Officejet printers prove that inkjet can match laser for colour and black and white document printing and surpass it in photo printing. HP Officejet ink cartridges produce laser-quality, crisp, smudge-free documents and brilliant, rich colour photos on photo paper.

This is because HP Officejet inks are based on the same technology as HP's Vivera inks, which on HP photo paper will produce minilab-quality, fade resistant photographs with true to life colour, fine colour gradations and rich colour saturations. But HP Officejet inks have additional ingredients which make them optimised for business. They are quick drying and water resistant so businesses never need to worry that ink will come off on hands or smear on the page.

Built for business

HP Officejet printers produce quality output, but they're also true business printers with all the ease of use and productivity features that businesses expect.

They're fast - HP Officejet prints at 36 ppm for black and white and 35 ppm for colour and if the office needs an all in one, the HP Officejet Pro L7590 includes wired networking, print, copy and scan facilities. There are always some business applications that require A3 output and HP can meet this need with the Officejet Pro K8600 printer.



HP's XL cartridge packs provide photo-quality prints that won't smear but will save you money

As well as printing on paper sizes up to A3+, Officejet Pro K8600 can handle envelopes, labels, cards and transparencies. Maximum print resolution is 1200dpi giving outstanding print quality results. There's also a duplex print option for double sided output and the HP Officejet Pro K8600 is network ready right out of the box for use on the office Ethernet.

The HP Officejet range is available from specialist high street retailers such as Staples and PC World; through HP's network of reseller partners; or direct from HP online.

Visit *www.hp.com/uk/pcw*

Don't alarm me... AlertMe.

Not just security, peace of mind

Home and family are important so you need to know everything's OK, wherever you are. AlertMe is revolutionary home security that truly connects you with your home. You can securely control and monitor it via the internet or your mobile phone. And it's more affordable, more secure, and easier to use than most traditional alarms.

Time to take control

You can easily personalise it to suit your lifestyle (no expensive service technicians needed) which puts you in control, not a call centre operator who has never seen your home.

More than a burglar alarm

AlertMe is designed for the way people really live, and is great for parents, frequent travellers, renters and homeowners alike. AlertMe also goes beyond traditional security in letting you know when children or others have come and gone from your home, recording the temperature of various rooms, and keeping a history of activity.

Ditch the drill

AlertMe connects straight to you using your broadband and wireless sensors around your home. AlertMe is quick and easy to set up - you don't need any tools, there's no need to drill any holes in your walls. Just plug in the hub, stick on the sensors, and you're good to go.

Be the first to know

If there's a problem, you and your chosen neighbours receive informative messages so you can verify the problem. If the alert is a false alarm, you can give the all clear. If there really is a problem you can immediately call the emergency services to respond.

A comprehensive kit for just £399 plus £11.75 per month for the service.*
Order now or find out more at alertme.com or call 0845 2002873.

www.alertme.com

when i need to know alertme

*Prices include VAT.

16IN TFT

Chimei CMV 633A

The smallest desktop widescreen monitor we've seen

Aside from those miniature 7in displays, which few would put on their desk for real work, you won't find a PC monitor that takes up much less space than this. Marketed as a 16in display, the viewable diagonal measures only 15.54in.

Its specification is rather uninspiring. It has a respectable response time of 5ms, but viewing angles and contrast ratios are a little weak. It also has a rather plain appearance, yet there's something about the CMV 633A that's so undeniably cute you'll pardon these shortcomings in an instant.

If you're short on space, it's a great companion for a small form factor PC, but in truth there aren't many spaces that really couldn't cope with something a little bigger and the CMV 633A's 1,336x768 pixels is a lower resolution than you'll get on most laptops.

However, what is impressive about this display is the build quality. For a monitor at this price, the construction is superb. We were also pleased to see options in the control menu such as display presets, including an sRGB mode for easy colour matching, along with modes for text and movie playback.

Despite what it says in the official specifications, the CMV 633A uses a TV-shaped 16:9 aspect ratio rather than the more common 16:10 found on nearly all widescreen PC displays.

This means if you're watching a standard widescreen video, your picture will be a little bit larger than you were expecting, filling the whole screen.

If you're using a standard 4:3 resolution, the monitor can optionally scale it automatically to avoid stretching out the image horizontally.

The CMV 633A crams a lot into a very small package, including a pair of stereo speakers. It won't win any performance tests, but as an ultra-compact monitor it's impressive. *Paul Monckton*

Verdict

Pros Small size; build-quality; aspect-ratio scaling

Cons Poor contrast, viewing angles and colour gamut; no DVI connector

Overall If you need a small monitor and aren't fussy about high specifications, this screen won't disappoint

Features	★★★★☆
Performance	★★☆☆☆
Value for money	★★★★☆
Overall	★★★★☆

Price £95

Contact Chimei www.chimei.eu

Specifications 16in TN panel • 1,366x768 pixel resolution • 270cd/m^2 brightness • 550:1 contrast ratio • Viewing angles: 100°(H)/70°(V) • VGA input connector • 1W stereo speakers • 38.2x15.5x31.5cm (wxdxh) • 2.7kg

19IN TFT

LG Flatron L197WH S+

Good looks and performance along with some interesting features

This 19in monitor from LG is so shiny it almost looks wet but, despite this, it's surprisingly resistant to fingerprint marks. Its dual-hinge construction gives you a variety of viewing angle options: at its simplest it acts as a height adjustment, but it also lets you tilt the display right back, much like a lectern.

LG's F-Engine technology is a fancy term for clever display presets. At the push of a button, the monitor will display a split screen with the enhanced image on the left and the 'normal' image on the right, making it much easier to decide which setting you prefer.

The stated 10,000:1 contrast ratio isn't available in standard screen modes, instead this dynamic contrast system is only for movie playback. In fact, activating it on the normal Windows desktop causes the display to look rather overblown – we also noticed distracting shifts in brightness as the dynamic element of the adjustment kicks in. However, during video playback and gaming it can provide a far more dynamic, engaging experience.

TFT panels work best at their native screen resolution, but with high-resolution monitors some users complain that the writing and icons on screen become uncomfortably small. With the monitor's EZ-Zoom key, you can quickly change the screen resolution at the touch of a button without having to alter any Windows settings. A full set of software utilities is provided that lets you control the monitor directly from your PC – your preferences are saved in profiles for easy retrieval.

In our tests, the monitor achieved good contrast ratios regardless of the F-Engine setting. It's also capable of some vivid colours, thanks to a moderately large colour gamut. Put these together and you get an impressive-looking display that reveals the flaws in some of the competition. *Paul Monckton*

Verdict

Pros Built quality; dual-hinge stand; good contrast; software utilities

Cons 10,000:1 contrast ratio works only in movie mode

Overall A good-looking display with a flexible dual-hinge stand and good colour performance

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★★☆

Price £163

Contact LG 0870 873 5454 www.lge.com

Specifications 19in TN panel (16:10) • 1,440x900 pixel resolution • 2ms response time • 300cd/m^2 brightness • 10,000:1 dynamic contrast ratio • 170° viewing angles • VGA and DVI-D connectors • 44x23.7x43.6cm (wxdxh) • 3.3kg • Three-year warranty

NETWORK-ATTACHED STORAGE

Apple Time Capsule

Well-designed network storage device, lacking one important feature

Time Capsule is primarily intended as a storage device for Mac owners using the Time Machine backup program included with OSX. However, it can also be used with Windows PCs or on a mixed Mac and PC network.

Time Capsule is, essentially, an 802.11n wireless router with a network hard disk built into it so that everyone on the network can share data. Our review unit was the £199 500GB model, but there's also a 1TB version for £329. Apple is often criticised for high prices, but Time Capsule compares well to similar devices such as Freecom's wireless Storage Gateway, which costs £224 for its 500GB version.

As you'd expect from Apple, the Time Capsule is easy to set up and use. A simple installer program guides you through the process of creating a new wireless network or adding the Time Capsule to an existing network. The unit also has three Gigabit Lan ports for wired connections, and a USB port that can be used to connect and share additional devices on the network, such as a printer or another hard disk.

Setting up the Time Capsule is straightforward enough, but although it features a Wan port for cable broadband users, it doesn't include a built-in modem. ADSL broadband subscribers will need to connect the Time Capsule to an existing modem/router in order to maintain their internet connection.

If you've already got a wireless router, you would probably be better off buying a standalone network-attached storage drive (500GB models can be picked up for just over £100). This leaves Time Capsule as an option for people who want to upgrade a wired network, but even then its lack of a built-in ADSL modem means it will only live up to its full potential when used in conjunction with a cable broadband service. *Cliff Joseph*

Verdict

Pros Convenient network storage and router; easy to set up and use
Cons No built-in ADSL modem
Overall As well designed as you'd expect from Apple, but the lack of built-in ADSL modem limits its appeal

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £199 (500GB)
Contact Apple 0800 048 0408 www.apple.com/uk
Specifications 802.11n • 500GB hard drive • 3 Gigabit Lan ports • 1 Gigabit Wan port • 1 USB2 port • WPA2/Wep • 197x197x36mm (wxdxh) • 1.6kg

GRAPHICS CARD

Palit Geforce 9600GT 512MB Sonic

A great card for those on a tight budget

Sonic is the name Palit gives to its overclocked graphics card range, the latest of which features Nvidia's G94 core, better known as the 9600GT. It's the first of Nvidia's Geforce 9 generation and, somewhat unusually, it hasn't been launched with an expensive, game-crunching card but instead with a more humble midrange model.

Don't let this fool you though – just like the 8800GT before it, the 9600GT offers excellent value for money.

The G94 is built on a 65nm process and is basically a cut-down version of the G92 8800 and GTS cards, but with fewer yet faster-clocked stream processors.

The 9600GT comes with 64 stream processors as standard, clocked at 1,625MHz. It also features a core running at 650MHz and 512MB of GDDR3 running via a 256-bit interface at 900MHz (1.8GHz effective). However, Palit has upped these specs with its Sonic version. The core speed has been tweaked 50MHz to run at 700MHz, while the memory clock has been boosted to produce 1GHz (2GHz effective) – 100MHz faster than the reference clock.

Palit has also changed the cooler on the 9600GT Sonic; the reference design is replaced by the copper radial cooler seen on previous Sonic models. This turns the 9600GT into a two-slot card, but the extra space it takes up is used to good effect.

The big surprise with the Sonic is the number of outputs it has, especially given its low price. You get two dual-link DVI ports, along with an optical S/PDIF and HDMI ports. There's also a Displayport socket, something rarely seen on graphics cards.

It might not top our performance tables, but this card from Palit is excellent value for money and is loaded with features. *Simon Crisp*

Verdict

Pros Great value for money; range of outputs; performance
Cons Palit's cooling turns it into a two-slot design
Overall Just like the 8800GT before it, the 9600GT offers plenty of bang for your buck, and Palit's Sonic adds a host of extra features

Features	★★★★★
Performance	★★★★☆
Value for money	★★★★★
Overall	★★★★★

Price £121.32
Contact Palit www.palit.biz
Specifications Nvidia Geforce 9600GT GPU • 700MHz core clock • 2GHz memory clock • 512MB GDDR3 • HDMI, Displayport, optical S/PDIF and two dual-link DVI ports

SOUNDCARD

Auzentech X-Fi Prelude 7.1

An impressive high-end, all-purpose soundcard

This soundcard is a bit special because it is built around one of Creative's X-Fi audio processors – the same chip that sits at the heart of all of Creative's latest cards.

Auzentech is the first company that Creative has allowed to make use of its X-Fi chip in this way. Like Creative's own cards, this one has great support for gaming surround-sound formats. It fully supports EAX (including EAX Advanced HD5.0, thanks to the 64MB of onboard X-Ram), OpenAL and CMSS-3D headphone surround sound. It also comes with Creative's Alchemy drivers, which allow Windows Vista users to get surround-sound support on older Direct Sound-based EAX games.

The card also features the excellent X-Fi Crystalizer technology, which does a great job of adding some of the oomph back into compressed MP3 and WMA music tracks. Plus, the card works a treat with music applications, thanks to the low-latency Asio 2.0 drivers.

But this is no mere Creative clone. Perhaps the biggest bonus on offer here is that the Prelude can encode surround-sound formats into Dolby Digital Live or DTS formats. This means that the audio can be sent to surround-sound speakers via a single digital audio cable; it works well and is much less hassle than having to hook up lots of different analogue cables. As well as this, Auzentech has improved the quality of the internal audio circuitry by using higher grade components and including high-performance digital-to-analogue converters. The end result is even cleaner and warmer sounding audio.

It all means that the Prelude is one of the best general-purpose soundcards we've heard. It might be a bit more expensive than the average soundcard, but the great audio quality, excellent surround-sound support and good music-creation features make it worth the extra outlay. *Niall Magennis*

Verdict

Pros Great sound quality; excellent driver support; onboard Dolby Digital Live and DTS encoding

Cons Overkill for mainstream market

Overall If you're into audio you'll find that this card's excellent sound quality and great range of features make it worth the money

Features	★★★★★
Ease of use	★★★★★
Value for money	★★★★☆
Overall	★★★★★

Price £129.99

Contact Auzentech
www.auzentech.com

Specifications

Playback: Stereo/Surround 24-bit/96KHz

Recording: Stereo 24-bit/96KHz • Mic In, line in, S/PDIF combo in • 7.1 analogue surround-sound out, S/PDIF out

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AUDIO INTERFACE

Terratec DMX 6Fire USB

External audio system for gamers and DJs, but audio enthusiasts will be left wanting

Despite the word 'fire' in the name, Terratec's latest take on budget audio/Midi I/O is USB2, not Firewire. Also, the ticket places it roughly in the category of competing Edirol, M-Audio and various other semi-pro interfaces. It has no OSX drivers, a single phantom-powered combo XLR mic input and, around the back, every line-audio connection is phono, all unbalanced, by definition. It's clear, immediately, that this is not a device aimed at the project-studio enthusiast or audio pro.

We're in DJ territory, and the DMX makes that quite plain by including something curiously lacking in many audio devices. This device used to be a PCI card, but now it uses USB2 and an external power supply to fire audio into the high-def 192KHz/24-bit range.

What really gives the game away, however, is a ground terminal for turntables – as does the prime placing of a socket for headphones. While catering for the needs of surround-sound-addicted gamers, or movie fans, the DMX is a gizmo very well suited towards cash-strapped disc jockeys.

The build quality is good, as is the -20dB-paddable (high-Z) instrument input. Optical, alongside coaxial digital, I/O is also commendable. But the paucity of balanced-audio connectivity is a mistake. It almost makes the Midi sockets look redundant since few DJs will use them.

The DMX 6Fire is a DJ tool. It seems capable of withstanding the rigours of club use and would make a handsome surround solution for home-entertainment buffs. But we would not recommend it for recording or Midi-sequencing enthusiasts. You need balanced audio connectors, and possibly more Midi options, in which departments the DMX falls short.

If you are a vinyl-wielding DJ, possibly driving a pair of Technics turntables or NI Traktor and physical interfaces, then you will appreciate the audio clarity, robustness and straightforwardness of Terratec's audio interface.

Karl Foster

Verdict

Pros Good-value surround capabilities; at least one balanced audio in with phantom power; ground terminal for decks

Cons Main audio I/Os are coaxial phono (unbalanced); no Mac drivers as yet; a single XLR/TRS audio in

Overall Home-recording enthusiasts will want more, but gamers and DJs will appreciate its sturdiness, sound quality and connectivity

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £199.99

Contact Terratec www.terratec.net

Specifications USB2 • Mic input • 48V phantom power • -20dB pad switch • Instrument input with gain control (6.3mm jack) • Four analogue inputs • Phono input • Six analogue outputs • Headphone jack (6.3mm) • Optical and coaxial digital input/output • Midi interface

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DIGITAL CAMERA

Pentax Optio A40

A 12-megapixel compact that's loaded with features

Compared with the current crop of 12-megapixel cameras, the Optio A40 sits at the higher end of the price range, so we were expecting big things from it to justify the cost. The first feature worth noting is the SR (Shake Reduction) tool. Using a sensor inside the camera, the SR mechanism shifts the CCD to compensate for camera shake (usually a problem when shooting at full zoom). You can either set it to leap in when required or, by pushing the Preview button on the top of the camera, activate it yourself.

Pentax has also included a dynamic-range compensation tool, the idea being that, when enabled, it boosts under-exposed areas of an image without affecting the rest of the scene. Although it worked to an extent during testing (dark areas were indeed brightened up), the sacrifices made, such as increased image noise, often outweighed the benefits.

The Optio A40 includes some advanced features, including a live histogram and both a shutter priority and manual mode, although strangely there's no aperture priority mode. Face recognition is also present, allowing the Optio A40 to detect faces and ensure they're exposed properly and in focus.

In general, image quality is good. Colours are vibrant and the camera usually makes a good judgement on the exposure. It did, however, have a tendency to select a higher ISO than required, resulting in some unnecessary image noise. And, as we've seen from Pentax cameras before, it loses focus slightly at the top-left corner of the frame, but you're unlikely to notice this outside of your image editor.

Although some of the Optio A40's features didn't always deliver perfect results, others, such as the SR tool, worked very well, making it a genuine contender in the high-end compact market. *Will Stapley*

Verdict

Pros Good colour accuracy; small and light; plenty of features
Cons Some exposure issues; occasionally opts for unnecessarily high ISO settings
Overall Some minor issues, but on the whole this is a decent high-end compact

Features	★★★★★
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★★☆

Price £219

Contact Pentax 0870 736 8299 www.pentax.co.uk
Specifications 12 megapixels • 1/1.8in CCD • 2.5in LCD monitor • 3x optical zoom (38-114mm, 35mm equivalent) • 1/2,000-4 sec shutter speed • ISO 64-3200 • 30fps movie mode • 22MB built-in memory • SD/SDHC card slot • 89x23.5x57mm (wxdxh) • 130g

DIGITAL CAMERA

Ricoh R8

An updated design with excellent ease of use and reasonable pictures

The compact R-series from Ricoh regularly gets updated, usually keeping the design much the same. However, the new R8 makes something of a stylistic departure from its forebears.

It's slightly larger than its predecessor, the Caplio R7, although the overall feel and build quality is much better. There's also an increase in sensor resolution from eight to 10 megapixels.

The R8 is pleasingly simple to use, with a functional design, intuitive mode dial and simplified menu layout; you won't have to search through endless menus as all the key operations are readily available during shooting. Its features have been pared down to avoid clutter, while important options such as face-recognition and anti-shake are retained.

The R8's more traditional approach to control comes in the form of a zoom-control lever mounted on the shutter release button, while a rubberised grip has been provided on the right-hand side, allowing the control buttons to now fall more naturally under the thumb.

The main four-way controller can be clicked to bring up an on-screen overlay, from which you can adjust parameters such as exposure compensation, ISO and white balance without taking your eye off the subject.

A 2.7in TFT display graces the rear. It's especially clear and sharp thanks to its 460,000-pixel resolution, which provides twice the detail we're used to seeing on this sort of camera.

One minor quibble is that the selected shooting mode isn't displayed on this TFT, so you have to check the top of the camera before shooting.

When it comes to image quality, we were neither overly impressed nor disappointed: We have seen better from compact cameras, but also a lot worse, and the R8's excellent ease of use should help you achieve some pleasing photos. *Paul Monckton*

Verdict

Pros Easy to use; good build quality; high-resolution display; fast operation
Cons Lack of mode information on LCD; no manual exposure modes
Overall An impressive compact with a well-balanced feature set and excellent build quality

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £249.99

Contact Ricoh 020 8261 4000 www.ricoh.co.uk
Specifications 10-megapixel CCD • 1/2.3in sensor • 7.1x optical zoom (28-200mm, 35mm equivalent) • 1cm macro • 1/2,000-8 sec shutter speed • 2.7in monitor with 460,000 pixels • 24MB internal memory • 640x480 movies at 30fps • USB2 • 102x26.1x58.3mm (wxdxh) • 168g • Two-year warranty

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Maplin USB2 to Sata/IDE Adapter

Price £39.99 **Contact** www.maplin.co.uk **Overall** ★★★☆☆

This combo adapter supports both Sata and IDE hard disk types in both notebook and desktop hard drive sizes, whereas external enclosures can only handle one size and type at a time.

This combo adapter can even accept both types of hard drive (Sata and IDE) at the same time. We tested it with a Blu-ray optical drive and notebook hard disk, both attached at the same time, and performance was excellent.

On the downside, its data and power wires are exposed in an ungainly manner and its 20cm USB cable is too short in most instances. It's also twice the price of a dedicated enclosure, but is more versatile. *Emil Larsen*

Overall Expensive, but ideal for hard drive addicts

Microsoft Wireless Laser Mouse

Price £54.99 **Contact** www.microsoft.com/uk **Overall** ★★★★☆

Microsoft's Wireless Laser Mouse 7000 is a stylish affair that sits comfortably in the hand and glides smoothly across the desk. A small docking station recharges the battery, but we found you need to be very precise when placing the mouse on the dock. The wireless connection is provided by a small 2.4GHz USB stick.

The two traditional buttons are joined by a smooth-scrolling wheel, which itself has three button actions, and two thumb-operated buttons – Microsoft says they're for one-touch magnification and Vista's Flip 3D tool, but the included software lets you reassign them. The extra buttons are well positioned, so you're unlikely to press them by accident. *Will Stapley*

Overall A well-designed mouse but there are cheaper alternatives

Autosafe Cubebyte

Price £22 **Contact** www.cubebyte.com **Overall** ★★★★☆

Almost all notebooks come with small slots designed for Kensington locks, allowing them to be secured to non-moveable items such as fixed tables and desks. However, slight variances in the size of the slot means all locks will not fit all notebooks. Cubebyte attempts to solve this problem by using a lock that adjusts to the size of any slot – two steel bars fill the lock when you turn the key.

As with all Kensington locks, the Cubebyte is really only of use if your notebook is nearby but out of sight. If a thief is out of earshot, such as in your home while you're away, it won't take long to break it using brute force, although the notebook may suffer some damage. *Will Stapley*

Overall A good design for all sizes of Kensington lock slots

3rd Space FPS Vest

Price £149.95 **Contact** www.firebox.com **Overall** ★★★☆☆

The 3rd Space FPS Vest looks like a bulletproof jacket, but with a USB port and a pump attached.

This gaming accessory hides a series air pockets, front and back, that expand rapidly to jab your body when you get shot during a game. It never hurts, but ticklish members of the PCW team simply burst out laughing when shot.

We played Call of Duty 2 (included in the box), where the vest jabs from the front when you get injured and jabs all over as you die. The pump that refills the air pockets is very noisy and it currently only supports nine games, but they are all top titles. *Emil Larsen*

Overall Great fun for short stints and everyone will want a go

PC Essentials

Our pick of the latest components and accessories

A-Data Vitesta DDR2-1066+ Extreme Edition
Price: £71.95
www.memoryc.com
Overall: ★★★★☆

A-Data produces a huge range of memory products, including fast desktop memory modules. The DDR2-1066+ Extreme Edition 2GB memory kit is part of its Vitesta performance range and comprises two 1GB sticks of DDR2-1,066MHz memory rated at 5-5-5-15 (1,066MHz) or 4-4-4-12 (800MHz).

OCZ ATV 32GB
Price: £88.07
www.ocztechnology.com
Overall: ★★★★☆

If you need plenty of storage in a neat, easy-to-carry and robust format, OCZ's high-speed ATV 32GB USB2 Flash drive will definitely appeal. It comes in a shock-resistant and waterproof rubber housing to protect it from everyday and not-so-everyday bumps and scrapes.

Akasa AK-965BL
Price: £17.95
www.akasa.co.uk
Overall: ★★★★☆

Although Akasa's AK-965 is a popular CPU cooler for Intel's Socket 775 processors, it's not the most exciting cooler you've ever seen. Now it has a flashier sibling – the AK-965BL. It comes with a clear fan frame lit by four blue LEDs, while the blades of the 92mm light up bright blue when the cooler is working.

Crucial Ballistix PC3-16000
Price: £375.99
www.crucial.com/uk
Overall: ★★★★★

Crucial has been quite late to the table with its DDR3 memory modules, but it's making up for lost time with the latest addition to the performance Ballistix range coming in the shape of PC3-16,000 (DDR3-2,000MHz) modules. The modules have 9-9-9-28 timings at 1.9V along with support for EPP 2.0. They're also certified as SLI-ready.

Freecom Toughdrive Pro 250GB
Price: £101.05
www.freecom.com
Overall: ★★★★☆

Small and light, Freecom's Toughdrive Pro 250GB not only comes with a huge capacity (for a 2.5in hard drive) but provides a good deal of physical protection for your data. It has a soft, silicone cover that can withstand a drop of two metres and there is a built in anti-shock mechanism. It also draws all the power it needs via the USB2 bus.

Cyberpower Value 1500E-GP
Price: £252.63
www.cyberpowersystems.com
Overall: ★★★☆☆

If the doom-watchers among us are right then a UPS (uninterruptible power supply) may become an essential item in the home. Cyberpower's UPS, the Value 1500E-GP is aimed at home office users. The 1500E-GP uses Cyberpower's Green Power technology to reduce power consumption, has a capacity of 900W and comes with a useful Windows-based management utility.

OCZ Vanquisher
Price: £13.23
www.ocztechnology.com
Overall: ★★★☆☆

The enticingly named Vanquisher from OCZ is a CPU cooler with three copper heatpipes. It supports both Intel LGA775 and AMD AM2, 939 and 754 sockets; the AMD fixing bracket comes in the box, although you have to remove the Intel fastener before you can use it. Airflow is provided by a ceramic-bearing 92mm fan.

Hiper HFF-1N12N Transparent
Price: £4.99
www.hipergroup.com
Overall: ★★★☆☆

The Transparent range of Hyperflow case fans is, as you might expect from the name, made using clear plastic. Models are available in 120mm and 80mm (£2.98) sizes. The 120mm nine-blade fan has a spin speed of 1,500rpm and a noise level of 19dBA. The fan comes with a 3-pin power connector, but a 3-pin to 4-pin Molex adapter is included in the box.

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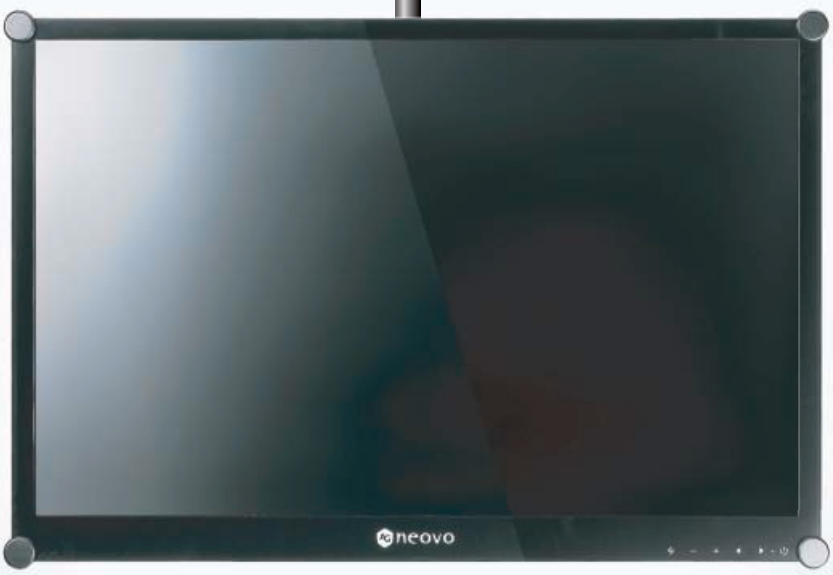

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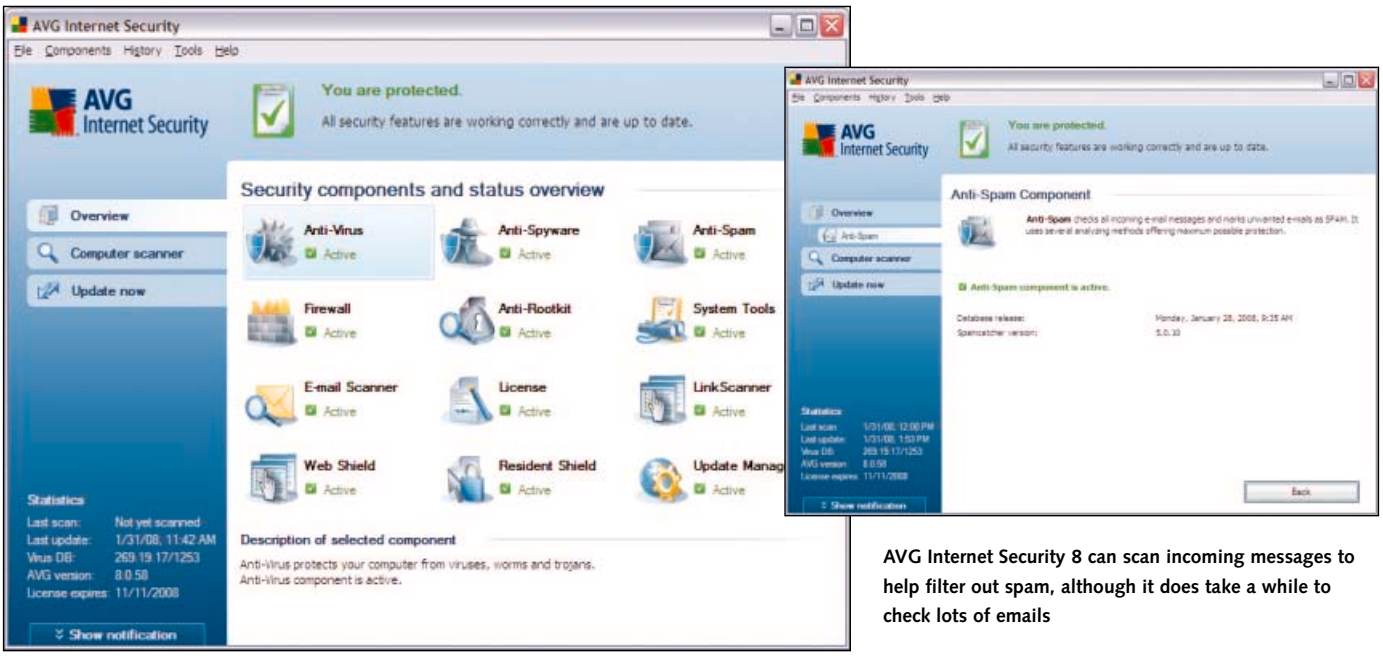
INTERNET SECURITY

AVG Internet Security 8

A revamped interface and extra web surfing protection



AVG Internet Security 8 can scan incoming messages to help filter out spam, although it does take a while to check lots of emails

Companies developing security software aimed at the home market have something of a problem on their hands at present. They want their software to appear simple and easy to use, but equally they need to boast about the level of protection offered. AVG, along with most of its competitors, appears to be shifting to the latter.

Although the revamped interface looks much slicker than previous versions, the first screen you're presented with has no fewer than 12 different icons, each indicating a different security module of the suite. Joining the usual anti-virus, firewall and anti-spam are anti-rootkit, Web Shield and Linkscanner.

By default, a full computer scan will check for all threats (be they viruses or spyware). The only exception is a scan for rootkits, which has to be added to the schedule manually. Only during these full scans did AVG hog our test PC's resources – at other times it kept below the radar.

AVG's anti-virus tool is available free and has a 100 per cent detection rate certified by the independent bodies ICSA Labs and VB100. Like most anti-virus packages, it detects viruses both by maintaining a list of known threats as well as heuristic scanning that detects new viruses based on their behaviour.

The firewall passed a series of leak tests, both closing and hiding ports from prying eyes, and a wizard helps novice users by scanning your PC for known applications requiring internet access. Once completed, you can review the applications AVG has detected.

AVG's anti-spam component has various features, such as the option to automatically remove attachments with predefined file extensions or define safe senders, but the process of detecting and then dealing with spam isn't quite so impressive. We tested it on a mailbox containing a mixture of obvious spam and genuine emails. Although it caught most of the spam, it also flagged up various marketing emails and newsletters. What's more, it simply places the text '[SPAM]', leaving you to set up a filter to deal with them in your email client. We were also disappointed at how long it took to scan incoming emails. It's not a problem if you've only got a few emails, but retrieving a lot will take a while.

The Linkscanner tool integrates with Internet Explorer and Firefox, and consists of two further components: Active Surf-Shield and Surf-Shield. The former scans pages in real time, warning you if there's potentially dangerous link, while the latter works in conjunction with popular search engines, placing a green tick next to results that are rated as safe.

AVG Internet Security 8 will set you back £39.99, which puts it about £10 cheaper than most rival products. However, this only includes one licence whereas the standard these days is three. On the AVG website you can add more licences, for £10 each, but if you go for the maximum of 10 (£149) you'll end up paying more than £10 for each one, which seems a little odd.

The software has its strengths, not least a robust anti-virus component, but certain elements of AVG Internet Security 8 disappoint. The anti-spam could be vastly improved, both in terms of the speed it takes to scan incoming mail and how spam is dealt with once identified. And although the array of components indicates comprehensive protection, it also adversely affects usability that may confuse those not up to speed with the latest security terminology. *Will Stapley*

Verdict

Pros Good anti-virus component; wide range of security tools; stylish interface

Cons Poor anti-spam; range of protection modules can be confusing; multi-licence version is expensive

Overall Solid protection from viruses and other attacks, but the anti-spam tool is relatively poor

Features	★★★★☆
Ease of use	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £39.99 (three computer licence £59.99)

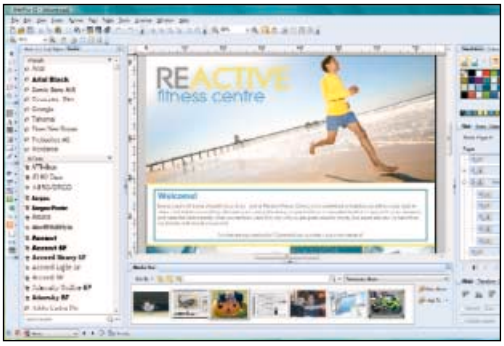
Contact AVG 0844 894 1000 www.grisoft.com

System requirements 1.2GHz processor • 256MB Ram • 70MB hard disk space • Windows XP/2000/Vista

WEB DESIGN

Serif Webplus X2

Website-creation suite with a strong focus on design



Web design falls into one of two camps: the first type designs the entire site, including content and design, in one place, the other designs a select few templates and relies on content management software to put articles in place. Webplus falls firmly in the former camp, but this does not mean that it passes up on the latest design possibilities.

We were pleased to find that layout uses CSS, not tables. This helps keep the layout of the pages as simple as possible, making them more accessible to mobile browsers and visible to search engines. The formatting information set with CSS is embedded in each page, which is a slight disappointment as using an external style sheet helps keep file sizes down.

Several master pages can be created as templates, helping to keep a consistent look across a site. The site manager tool is also useful for planning, and navigation bars can be created automatically.

The design heritage is clear from the ability to link text boxes together to flow copy from one to the other. There is even an automatic flow tool for creating as many boxes as are required on following pages. There are also plenty of attractive text tools with effects, including flowing text along lines.

There is a blog tool, but it can only be updated from within Webplus and is rather inflexible in design, as is the RSS viewer.

You can also insert HTML code fragments, which will come in handy when using tools that require small snippets of HTML, such as Google Analytics.

Ecommerce is supported for accounts with Paypal, Romancart and Mals, and HTML forms can be inserted for reader feedback.

Webplus would suit sites with relatively static content, but if you frequently update or have several contributors, there are better options. *Tim Smith*

Verdict

Pros Plenty of tools for attractive design; ecommerce tools; uses CSS

Cons Geared towards static content

Overall Works best when creating static sites and would suit those with a design background

Features	★★★☆☆
Ease of use	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £60

Contact Serif 0800 376 7070 www.serif.com

System requirements Pentium processor or faster • 256MB Ram • 389MB hard disk space • Windows 2000/XP/Vista

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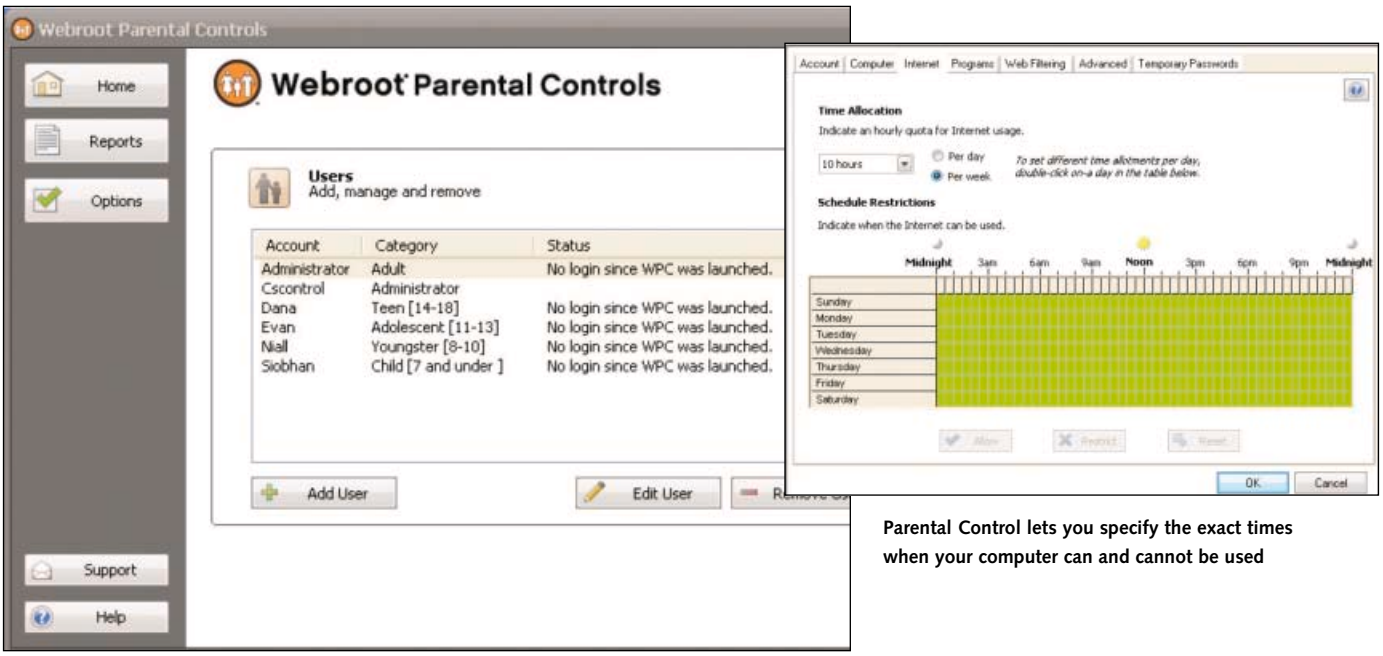
www.euteliavoip.co.uk

PARENTAL CONTROL

Webroot Parental Controls

Block inappropriate content and restrict access to the internet



Parental Control lets you specify the exact times when your computer can and cannot be used

Controlling what children get up to on a computer is guaranteed to challenge even the most experienced of systems administrators, let alone devoted parents. Even with the various extra controls that are built into Windows Vista, undesirable sites can slip through the net.

Parental Controls, from Webroot, does a very good job of giving an extra level of control, beyond what is already included with Windows Vista.

Creating user accounts in Windows is the only way to differentiate between members of the family and Parental Controls takes the sensible decision to use these Windows accounts, rather than demanding a separate username and password to access the internet – something that can result in the software being removed altogether.

The accounts are conveniently integrated into the Parental Controls interface, so there is no need to keep switching backwards and forwards. The only limitation is that the options only become available after the user has logged for the first time; however, this only adds a couple of minutes to the one-off setting-up process. A special account is created to allow you to alter the software settings – this is required since it is not possible to change the settings for the account that that is currently logged in. There are five templates for user accounts, covering different age ranges.

The most obvious control requirement is web filtering, and Parental Controls comes with a one-year subscription for updates. There are more than 60 different categories that are well thought out and, should you need to, individual sites can be added to the block list on an ad-hoc basis. You can also add keywords to the block list.

Control over programs is important and this is laid out by the Start Menu, making it easier to find and control access to all the various programs installed on your PC. Furthermore, many users will want to impose certain restrictions on what users can get up to within the Windows environment. Accessing the Task Manager or Command Prompt are common ways of getting around restrictions, and Webroot Parental Control can block these and more. Drives can also be blocked, although blocking optical drives is less important with the boom in USB memory sticks. Access to the Add/Remove Programs section in the Control Panel can be restricted, so certain users won't be able to install or remove software, and you can even instruct the program to block attempts to log on to websites by entering their address into the Windows Explorer address bar.

Parental Control lets you specify the times when the computer can be used. While we don't agree with the claim that setting the computer to automatically log children out of the computer at dinner or bedtime will prevent arguments, it at least puts the power back in the hands of the parent.

Should you want to temporarily lift some restrictions, single-use passwords can be granted which, when entered, can perform actions such as extending the amount of time allowed on the computer or temporarily allowing for extra software to be used.

Prevention is often better than cure, but it is still helpful to be able to see what children have been up to. Webroot Parental Control can compile reports on a variety of activities and these can be emailed to a specific address.

Tim Smith

Verdict

Pros Makes use of Windows user accounts; variety of protection and control features

Cons Only a one-year web filter subscription

Overall Comprehensive software for any computer owner wanting better control over what their users do, be they children or adults

Features	★★★★☆
Ease of use	★★★★☆
Value for money	★★★☆☆
Overall	★★★★½

Price £25

Contact Webroot 0845 0822 498 www.webroot.com

System requirements 133MHz processor • 128MB Ram • 5MB hard disk space • Windows XP/Vista

IMAGE CAPTURE

Topaz Moment 3.4

Grab impressive-looking images from video footage

Precious moments can can be fleeting and, sometimes, with a regular camera, it's easy to miss the vital moment; your finger is just about ready, and then the scene has gone.

Videography offers more real-time potential, but with lousy resolution, clarity and sharpness. Many modern camcorders have a high-resolution stills-capture mode that can be used while shooting video, but it's easy to forget to fire and extracting a frame later from video is often unrewarding. Topaz Labs has developed still-capture software that can extract a photographic image from a video sequence. Moment 3.4 promises to extrapolate a sharp photo print from a plethora of video formats (including AVI, MPEG, Quicktime and more) by the simple expedient of analysing a neighbouring sequence of seven frames and then turning them into a relatively super-sharp still.

Results are impressive. In no way do they approach the definition of a modern digital SLR, but you can certainly haul the low-resolution output of a consumer-type 4:3 digital camcorder into something printable at 6x4in.

Disappointingly, while working with the output of an inexpensive, standard-definition Panasonic camcorder, the capture appeared squashed due to Moment messing with aspect ratio. It's easy to work it up in Photoshop, but that's another editing process and leads to further image-noise. Also, output choices are limited to BMP and JPEG – there's no TIFF option.

Nevertheless, this video frame-grabber handles many video codecs, has a wealth of image-enhancing tools and could well supplant the capture software of whatever was bundled with your camcorder, such is its ease of use. Moment 3.4 is elegant, lives up to its promise and is great value. *Karl Foster*

Verdict

Pros Very easy to use; multiple-frame analysis function; supports many video formats

Cons Only BMP and JPEG output; output quality may be inadequate for some

Overall A good job by Topaz, giving hope to photographers seeking sharper definition from extracted stills

Features	★★★☆☆
Ease of use	★★★★★
Value for money	★★★★★
Overall	★★★★☆

Price $39.99 (£20 approx)

Contact Topaz Labs
www.topazlabs.com

System requirements 1GHz processor • 256MB Ram • Windows 2000/XP/Vista

ADVENTURE GAME

Lost: The Video Game

Fun while it lasts, but not challenging

Television programmes tend not to get the computer game treatment as frequently as feature films do and there's probably a good reason we never see desktop adaptations of *Coronation Street* or *Antiques Roadshow*.

As it happens, however, the desert island drama *Lost* lends itself well to games. Anyone familiar with the show will know that it follows the misfortunes of Oceanic Flight 815's survivors as they deal with the tropical trials and tribulations of life after a plane crash, along with the perils of secret hatches, gaseous cloud monsters and, of course, 'The Others'.

The game's so-called episodes slot neatly into the programme's timeline somewhere during the show's first two series. Perhaps wisely, Lost's creators have steered away from putting you in control of any of the main characters, although most of the original cast can be seen here in computer-generated glory.

Instead, you play a hitherto unseen member of the ill-fated aircraft's passenger manifest, a photographer suffering from amnesia. The gameplay is easy to pick up and follows an action-adventure theme, with puzzle solving, exploration, basic combat and a lot of interaction with other characters. Memory loss plays a big part, as you piece together your past via flashback sequences.

While some of the computer-generated characters appear more convincing than others, the jungle looks amazing. Sound effects, voice acting and music – all authentic to the TV show – are also good. Though fun while it lasts, the game is neither very challenging nor particularly lengthy. Whether you enjoy your time on the island will largely depend on your feelings for the show itself: public opinion of the programme seems to be split between fervent appreciation and utter bewilderment. As such, Lost: The Video Game is likely to have a niche appeal and is unlikely to win the series any new fans. *Jonathan Parkyn*

Verdict

Overall Impressive visuals and audio, but this is definitely a game with niche appeal

Overall ★★★★☆

Price: £30

Contact Ubisoft www.lostgame.com

System requirements 2.4GHz processor • 1GB Ram • 5GB hard disk space • 128MB graphics card (DirectX 9) • DVD drive • Windows XP/Vista

SPORTS SIMULATOR

Speedball 2 – Tournament

After almost 20 years, the cult hit returns

The original Speedball arrived on the Amiga back in the late 1980s. A couple of years later, Speedball 2: Brutal Deluxe was released and became an instant cult hit. Now, after almost two decades, we have Speedball 2 – Tournament.

Set in the future, two teams of nine are pitted against each other in an indoor arena. With very few rules, it's basically a case of score as many goals as you can. As in previous versions, it's a fairly violent affair, and if an opposition player gets in your way there will be no punishment for a swift punch in the face – it will, in fact, earn you extra points.

Although it doesn't take long to master the basics, scoring a goal proved difficult at first. That was until we discovered that by running up to the goalie and making a quick change of direction we could easily circumnavigate him and literally run the ball into the back of the net. In our first competitive match we scored 12 goals to the opposition's one. We restarted the game using the highest difficulty setting but, with our new-found skills, by half time we had more than doubled our previous goal tally. Worse still, members of the other team didn't seem interested, often running away from the action rather than making a tackle. The Team Management tool lets you enhance your players' abilities, but there are few options to play around with and it makes little difference in single-player mode.

Thankfully there's an Online multiplayer alternative, and it's here where most of the game's appeal lies. But although team management can give you an edge over the opposition, with such a basic set of controls and few interesting features this game will not hold your interest for long. *Will Stapley*

Verdict

Overall Good for an instant adrenaline hit, but it has limited long-term appeal and a woeful single-player mode

Overall ★★☆☆☆

Price £19.99

Contact Ascaron Entertainment www.speedball2.com

System requirements 2GHz processor • 512MB Ram • 2GB hard disk space • 128MB graphics card with Pixel Shader 2.0 • DVD-Rom • Windows XP/Vista

Best Buys

Your one-stop guide to the best-value products reviewed by PCW

With countless products available, shopping around for a new PC, peripheral or software package isn't an easy task, but with our Best Buys you can make a quick purchase with confidence. We've split our Best Buys into 40 of the most popular categories, covering everything from desktop and notebook PCs right through to digital cameras and software. Every month we update our Best Buys to include our most recent reviews and check the current pricing, although that's not to say you won't find a bargain online (try our price comparison site at **www.pcw.co.uk/bestprices**). You'll also find the date of the magazine in which the product was first reviewed, along with an alternative suggested product for that category.

If the Best Buy entry has a web code listed alongside it, it means you can read the full product review on our website. Simply head online and use the format **www.pcw.co.uk/[web code]** (for example **www.pcw.co.uk/2208243**).

Each Best Buy product has gone through our rigorous testing and reviewing procedures, making this your one-stop guide to the best products on the market.

BUDGET PC

Chillblast Fusion Sentinel
Price: £699
Reviewed: May 2008
www.chillblast.com
Web code: N/A
A well built, quiet PC with good all-round performance and enough space in the case for future upgrades. It features an overclocked Intel Core 2 Quad Q6600 processor and an Nvidia Geforce 8800GT graphics card.

ALTERNATIVE

Maxdata 300XS Mini PC
£589 www.pcwb.com Web code: 2209319
An inconspicuous Vista PC with low power consumption and design that lets you attach it direct to the back of a monitor with a Vesa 100 mount.

HIGH-END PC

Cyberpower Gamer Infinity SLI GX2
Price: £1,999
Reviewed: June 2008
www.cyberpowersystem.co.uk
Web code: N/A
This PC has an astounding amount of power, a great look and premium extra features. It's perfect for high-resolution gaming and comes with a 22in TFT, decent keyboard and mouse.

ALTERNATIVE

Ultravoilet Genesis XOC
£4,464.93 www.ultravoiletmachines.com Web code: N/A
The price may make your eyes water, but it doesn't get much faster than this with an overclocked QX6850 and two 8800 graphics cards

BUDGET NOTEBOOK

Asus Eee PC 4G 701
Price: £220
Reviewed: March 2008
www.asus.com
Web code: 2206346
It's no speed demon, but the Eee PC from Asus is the cheapest laptop you'll find. It runs a Linux operating system, has easily upgradeable components and is incredibly small. At this price, it's an absolute steal.

ALTERNATIVE

HP Compaq 6715b
£586 www.hp.com Web code: N/A
With a 2GHz AMD Turion processor, 2GB of Ram, 160GB hard drive and 15.4in screen, this HP Compaq notebook is great value for money.

HIGH-END NOTEBOOK

Toshiba Satellite X200-219
Price: £1,399
Reviewed: April 2008
www.toshiba.co.uk
Web code: N/A
Thanks to its Core 2 Duo T7500, 320GB storage and pair of Nvidia Geforce 8600GT graphics cards, this is a superbly fast notebook. It comes with an HD DVD reader, great for watching high-definition movies.

ALTERNATIVE

Alienware Area-51 m9750
£2,487.48 www.alienware.co.uk Web code: N/A
With a 64GB solid-state drive, this Alienware notebook is no slouch. It also has two Nvidia Geforce 8700M graphics cards for fast gaming.

ULTRAPORTABLE NOTEBOOK

Lenovo Thinkpad X61
Price: £1,516
Reviewed: January 2008
www.lenovo.com/uk
Web code: 2199269
If you're looking for a notebook to take on long journeys the Thinkpad X61 is the one to go for. It features a great screen, excellent keyboard and long battery life.

ALTERNATIVE

Samsung Q45-A007
£799 www.samsung.com/uk Web code: N/A
It might not be the lightest notebook available, but at 2.3kg it certainly won't break your back and you'll be rewarded with excellent performance.

ULTRA-MOBILE PC

Samsung Q1 Ultra
Price: £799
Reviewed: October 2007
www.samsung.com/uk
Web code: 2193548
This update to the popular Q1 brings a Qwerty keyboard, faster processor and better battery life. It also has a high-quality screen, comes with Windows Vista Business and is one of the cheaper ultra-mobile PCs.

ALTERNATIVE

OQO Model E2 HSDPA
£1,369.11 www.oqo.com Web code: 2206509
Not as well designed as Samsung's Q1 Ultra, but the keyboard is bigger and it comes with an HSDPA Sim-card slot for high-speed mobile broadband.

BUDGET GRAPHICS CARD

Palit Geforce 9600GT 512MB Sonic
Price: £121.32
Reviewed: June 2008
www.palit.biz
Web code: N/A
The G94 GPO used by this card is basically a cut-down version of the G92 8800 and GTS cards, but with fewer yet faster-clocked stream processors.

ALTERNATIVE

Asus EAH2400Pro
£32.89 http://uk.asus.com Web code: N/A
This card features low power consumption and, although not as fast as the Radeon HD 2400 Pro cards, it's cheap and has some impressive video capabilities.

HIGH-END GRAPHICS CARD

Foxconn FV-N88SMCD2-ONOC
Price: £195
Reviewed: Christmas 2007
www.foxconnchannel.com
Web code: N/A
You're getting a lot for your money with this 320MB card and the performance difference between this and the more expensive 640MB is slight. It comes with a USB joypad and a two-year warranty.

ALTERNATIVE

EVGA 8800 Ultra Superclocked
£487 www.evga.com Web code: N/A
An expensive choice, but it has excellent power usage and therefore more headroom for overclocking, which it uses to push the core clock speed to 612MHz.

TFT (17-22IN)

Philips 220WS8
Price: £189
Reviewed: February 2008
www.philips.co.uk
Web code: N/A
This 22in TFT screen has superb image quality, is evenly lit and, with a power draw of just 35W, it's also extremely efficient. The icing on the cake is Philips' excellent pixel policy. A great buy.

ALTERNATIVE

Viewsonic VX2255
£259 www.viewsoniceurope.com Web code: N/A
The VX2255's clear and excellent pixel policy along with its multimedia features mean it is great value at £259, despite the distinctly average image quality.

TFT (24IN+)

Samsung Syncmaster 245B
Price: £299
Reviewed: November 2007
www.samsung.com/uk
Web code: 2196900
Featuring accurate colours, a wide gamut and an adjustable stand, this Syncmaster 245B is a great-value 24in screen in a stylish chassis. It also houses VGA and DVI inputs, complete with HDCP support.

ALTERNATIVE

Hazro HZ26W
£576.82 www.hazro.co.uk Web code: 2202867
Although a little light on features, this is a high-quality S-IPS panel and excels both in terms of build quality and on-screen image quality.

PROJECTOR

Panasonic PT-AX200E
Price: £1,099
Reviewed: March 2008
www.panasonic.co.uk
Web code: N/A
Bright enough for general PC use and amazing with movies and games, Panasonic's PT-AX200E HD projector is a wise choice and comes with dual HDMI inputs along with excellent Game and Cinema presets.

ALTERNATIVE

Benq W500
£704 www.benq,co.uk Web code: N/A
At £700 the Benq is something of a bargain and makes for an ideal entry-level home projector and features 1080p/24 support.

SAT NAV

Tomtom Go 720
Price: £309
Reviewed: February 2008
www.tomtom.com
Web code: N/A
You're paying a bit more than you might for a number of perfectly capable rivals, but you get so much for your money with the Tomtom Go 720, including a customisable display and great performance on the road.

ALTERNATIVE

Mio 620t
£269 www.mio-tech.be Web code: N/A
Mio's new software is impressive and, considering the range of features, it's priced competitively. The maps look great and performance is equally good.

SMARTPHONE

02 XDA Stellar
Price: £From free
Reviewed: March 2008
www.o2.co.uk
Web code: 2207227
Available on a number of other networks (and Sim-free) this smartphone features a slide-out display, Qwerty keyboard, built-in GPS and Windows Mobile 6. The screen also tilts for easier typing.

ALTERNATIVE

Nokia E51
£From free www.nokia.co.uk Web code: 2200554
Marketed as a business phone but with Wifi, HSDPA and multimedia tools, such as an FM Radio, it's great for corporate and home users.

DIGITAL CAMERA

Ricoh R8
£249.99
Reviewed: June 2008
www.ricoh.co.uk
Web code: N/A
The R8 is simple to use, with a functional design, intuitive mode dial and simplified menu layout. You won't have to search through endless menus as all the key operations are readily available during shooting.

ALTERNATIVE

Pentax Optio A40
£219 www.pentax.co.uk Web code: N/A
This 12-megapixel compact camera houses some great features, not least of which is the excellent image stabiliser. It also shoots great photos.

PORTABLE MEDIA PLAYER

Sony NWZ-A815
Price: £89
Reviewed: January 2008
www.sony.co.uk
Web code: 2203060
It might lack some of the extra features found in other media players, but this Sony model excels in terms of audio quality and is easy to navigate. It also comes with a decent set of headphones.

ALTERNATIVE

Apple iPod Nano
£129 www.apple.com/uk Web code: 2199118
An astonishing design that produces good-quality video and audio. It also benefits from excellent battery life.

MEDIA STREAMER

Archos TV+
Price: £249
Reviewed: May 2008
www.archos.com
Web code: 2210545
With a 250GB hard drive, this device not only streams media across your network, but will also store content for retrieval. It's also a PVR, features a Qwerty remote control and has optional web browsing.

ALTERNATIVE

Linksys DMA2200
£229 www.linksys.com Web code: 2208886
This Media Center extender will stream movies, music and photos from your PC with the minimum of fuss.

LASER PRINTER

Brother HL-2170W
Price: £149
Reviewed: March 2008
www.brother.co.uk
Web code: 2207225
If you're looking for a good-quality mono laser printer for general home use, this Brother model is definitely worth considering. It's fast, compact and even has a wireless adapter. A bargain at this price.

ALTERNATIVE

Lexmark X500n
£301 www.lexmark.co.uk Web code: N/A
An amazingly good-value laser considering it's not only colour but also includes a scanner allowing you to scan, copy and print at speed.

PHOTO PRINTER

Canon Selphy CP750
Price: £110
Reviewed: October 2007
www.canon.co.uk
Web code: 2193769
It's a little bulky when in use, but this dedicated photo printer can produce high-quality prints in less than 70 seconds. A 2.4in display lets you perform basic image editing before printing.

ALTERNATIVE

Sony DPP-FP90
£150 www.sony.co.uk Web code: 2196751
It's not particularly cheap to run, but this printer produces high-quality photos from a variety of sources and is reasonably fast as well.

MULTIFUNCTION PRINTER

HP Photosmart C7280
Price: £249
Reviewed: May 2008
www.hp.com/uk
Web code: N/A
Aimed mainly at home office users who need both a fax and great photo printing. Combine this with high quality printing, scanning and copying and you've an impressive piece of kit on your hands.

ALTERNATIVE

Kodak Easyshare 5500
£199 www.kodak.co.uk Web code: 219926
This multifunction device features decent print, copy and scan functions, but it's big draw is the low running costs.

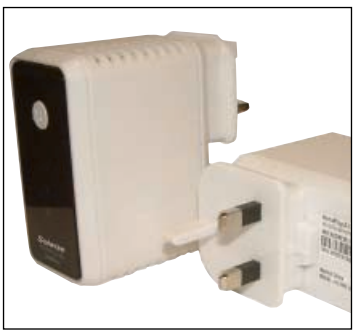
NETWORK-ATTACHED STORAGE

Qnap TS-209
Price: £254
Reviewed: Christmas 2007
www.qnap.com
Web code: 2200223
If you're after a Nas device that does more than just share files over your network, this is it. You can schedule Bit Torrent downloads, stream media to UPnP devices and install your own drives in it.

ALTERNATIVE

Acer Aspire Easystore
£499 www.acer.co.uk Web code: 2206105
This Nas device features 2TB of storage (other sizes are available) along with wireless so you can place it anywhere in your home.

POWERLINE NETWORKING



Solwise NET-PL-200AV Push
Price: £50
Reviewed: March 2008
www.solwise.co.uk
Web code: 2207035
You'll need at least two of these to get your powerline network running, but they're the best around. Based on the Homeplug AV standard they're fast, resilient to electrical noise and great value for money.

ALTERNATIVE

Devolo Dlan 200 AV
£149 www.devolo.co.uk Web code: N/A
Small and well designed, these Devolo powerline devices use the Homeplug AV standard and have pre-programmed Quality of Service rules built in.

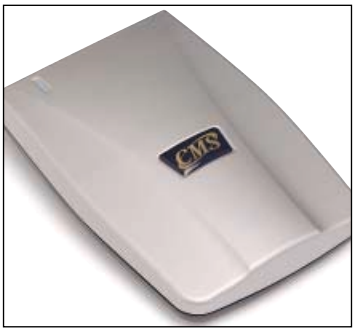
WIRELESS ROUTER

Linksys WAG325N
Price: £99.99
Reviewed: May 2008
www.linksys.com
Web code: N/A
It might look a little unconventional, but this Draft-N router from Linksys performs extremely well. It also features some sophisticated tools including VPN support and the option of creating virtual wireless networks.

ALTERNATIVE

Solwise Engenius Wireless-N Gigabit Router
£120 www.solwise.co.uk Web code: n/a
It might be a little pricey, but this router performed well in our tests and comes complete with some advanced network filtering tools.

EXTERNAL HARD DRIVE



CMS V2ABS-CE-120
Price: £175
Reviewed: Christmas 2007
www.cmsproducts.com
Web code: 2202396
A portable USB2 external hard drive that weighs a mere 150g and comes with built-in 256-bit AES encryption. Inside the case sits a 2.5in 120GB 5,400rpm Sata notebook drive.

ALTERNATIVE

Western Digital Mybook Studio
£204 www.westerndigital.com Web code: 2206075
This stylish 1TB external drive comes with USB2, Firewire 800/400 and eSata interfaces for ultimate flexibility.

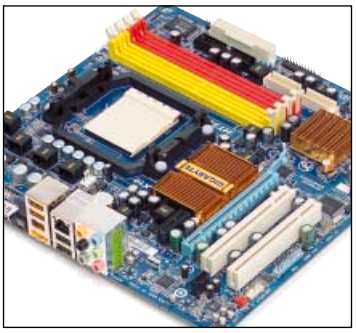
INTERNAL HARD DRIVE

Western Digital WD10EACS
Price: £185
Reviewed: January 2008
www.westerndigital.com
Web code: 2203061
This drive features four 250GB platters to provide 1TB of storage. It includes some advanced technology such as Intelliseek, which calculates optimum seek speeds to lower noise, vibration and power usage

ALTERNATIVE

Toshiba MK2035GSS
£79 www.toshiba.co.uk Web code: 2203064
Weighing just 98g this 200GB 2.5in Sata hard drive is perfect for increasing the storage capacity of your notebook.

AMD MOTHERBOARD



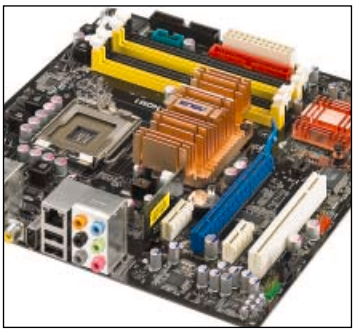
Gigabyte GA-MA78GM-S2H
Price: £60
Reviewed: June 2008
www.giga-byte.co.uk
Web code: N/A
With a wide range of ports, including eSata, and a good selection of options in the Bios, this is a great AMD board. Finally, after two years of losing to Intel, AMD's engineers have a winner on their hands.

ALTERNATIVE

EQS AB1S-RS690MKM
£46 www.eqscomputers.com Web code: 2204803
The cramped design limits upgrade potential, but it's a keenly priced AMD motherboard that features an on-board HDMI port for HD video.

INTEL MOTHERBOARD

Asus P5E-VM HDMI
Price: £81
Reviewed: June 2008
http://uk.asus.com
Web code: N/A
This board has a great range of features. With the integrated graphics enabled, we comfortably overclocked it to 3GHz with our 2.4GHz Core 2 Quad Q6600 attached, so enthusiasts should take note of its capabilities.



ALTERNATIVE

Gigabyte GA-G31MX-S2
£53 www.giga-byte.com Web code: 2202711
Considering the price, you get plenty of features on this Intel board, including Intel's G31 Express chipset and ICH7 Southbridge.

PC CASE

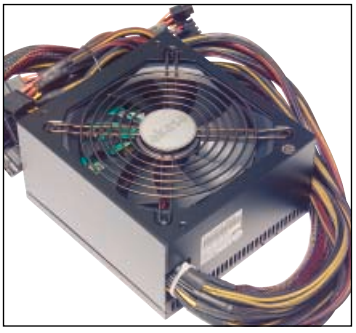
Akasa Eclipse-62 V2
Price: £92.38
Reviewed: May 2008
www.akasa.co.uk
Web code: N/A
It might not have the flashy design of some cases, but with the whole case, including the roof, able to come apart, along with its easily-removable motherboard plate, it's the ideal chassis enthusiasts and modders alike

ALTERNATIVE

Coolermaster Cosmos 1010
£139.83 www.coolermaster.com Web code: n/a
Thanks to its extra-large design, this case not only looks impressive but is also very easy to work on and comes complete with temperature probes.

POWER SUPPLY

Akasa Powermax 1000
Price: £135.11
Reviewed: March 2008
www.akasa.co.uk
Web code: 2207736
This 1,000W power supply has two +12V rails and the single 135mm dual-ball bearing fan makes it a lot quieter than you would expect. It comes with a variety of power connectors.



ALTERNATIVE

Enermax Galaxy 1000W
£233.83 www.enermax.com.tw Web code: 2164011
The 1,000W Enermax Galaxy power supply will suit those with SLI graphics and other power-sapping components, but it comes at a fairly high price.

OFFICE SUITE

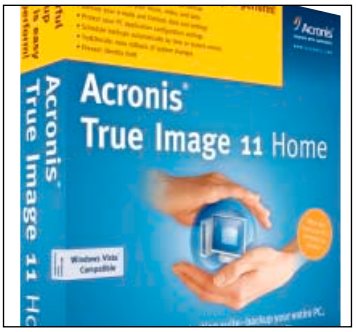
Microsoft Office 2007
Price: £357
Reviewed: May 2007
www.microsoft.com
Web code: 2183475
The new interface to Office is something you'll either like or loathe – we like it, but upgrading comes at a price, both in cash and in effort. Despite this, it's still the leader in office productivity software.

ALTERNATIVE

Corel Wordperfect X3
£276 www.corel.co.uk Web code: 2149856
This latest version of Corel's office suite includes tools such as PDF exporting along with improved compatibility with other office applications.

SYSTEM UTILITY

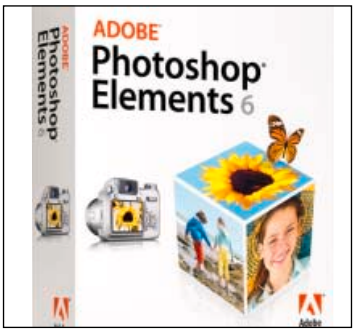
Acronis True Image 11
Price: £39.99
Reviewed: April 2008
www.acronis.co.uk
Web code: 2208669
True Image 11 is an excellent backup and recovery solution that offers an unprecedented level of control over disk cloning, scheduled backups and secure file deletion. And, despite the range of features, it's easy to use.



ALTERNATIVE

Paragon Hard Disk Manager
£29.99 www.paragon-software.com Web code: 2205339
A comprehensive, all-in-one suite of hard disk maintenance and backup tools that's easy to get to grips with and comes at a good price.

IMAGE EDITING



Adobe Photoshop Elements
Price: £69
Reviewed: June 2008
www.adobe.co.uk
Web code: N/A
Although the interface could do with some work, this is still the best image editor currently available for home users. With a range of advanced tools, it really does help you get the best from your photos.

ALTERNATIVE

Corel Paint Shop Pro X2
£79 www.corel.com Web code: n/a
A little bit more expensive than its main rival, Photoshop Elements, but Paint Shop Pro X2 excels in terms of ease of use.

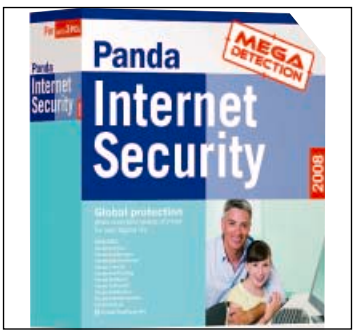
VIDEO EDITING

Pinnacle Studio 11 Ultimate
Price: £89.99
Reviewed: November 2007
www.pinnaclesys.com
Web code: N/A
This video-editing package is well designed and has powerful video tools, advanced audio tweaking and an easy-to-use interface. A standard version, without the high-definition features, is available for £39.

ALTERNATIVE

Cyberlink Powerdirector 6
£49.99 www.cyberlink.com Web code: 2174641
Although this budget video-editing suite lacks advanced editing tools, it's incredibly easy to use and is attractively priced.

PC SECURITY



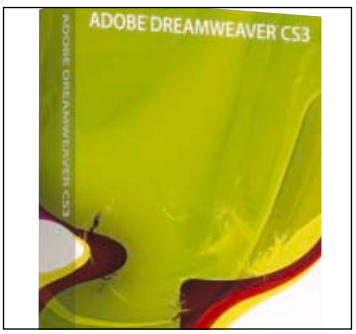
Panda Internet Security 2008
Price: £42.99
Reviewed: January 2008
www.pandasecurity.com
Web code: N/A
A feature-packed internet security suite with fast anti-virus and spyware detection tools, including heuristic scanning. It also has fast scan times and a decent firewall, along with backup and PC optimisation features.

ALTERNATIVE

Agnitum Outpost Pro Security Suite 2008
£30.80 www.agnitum.com Web code: 2204511
Outpost offers solid protection at a competitive price with fast scanning and a quality firewall, though it does lack some extras found in rival suites.

WEB DESIGN

Adobe Dreamweaver CS3
Price: £393
Reviewed: July 2007
www.adobe.com
Web code: 2186591
Powerful HTML coding and design tools along with CSS templates and Ajax widgets to help non-programmers get started. There's also a big emphasis on CSS, including a CSS Advisor tool for newcomers.



ALTERNATIVE

Microsoft Expression Web
£260 www.microsoft.com Web code: 2185242
Expression Web is a very good web-editing suite if you accept the inevitable Microsoft bias, featuring CSS support and a powerful interface.

BUSINESS PC

Dell Latitude D531
Price: £586
Reviewed: October 2007
www.dell.com
Web code: N/A
With a dual-core AMD Turion processor clocked at 1.8GHz, 2GB of Ram and Vista Business, this is a good budget model. It also features a built-in DVD writer, 120GB Sata hard disk and both Wifi and Bluetooth.

ALTERNATIVE

HP Compaq dc7800
£598 www.hp.co.uk Web code: 2207533
The space-saving design of this affordable business desktop is very compelling and it can attach directly to an optional HP TFT screen.

BUSINESS PRINTER

HP Laserjet P1505n
Price: £205.63
Reviewed: June 2008
www.hp.com
Web code: N/A
Compact, stylish and quicker than it looks, this Laserjet from HP is a very capable small-business printer and is stunningly good value to boot. It also features an integrated network interface.

ALTERNATIVE

Zebra P100i
£1,245.50 www.zebracard.com Web code: 2212221
A great device for small businesses needing to print plastic cards in volume. It takes up little desk space and is able to print in full colour.

NETWORK SECURITY

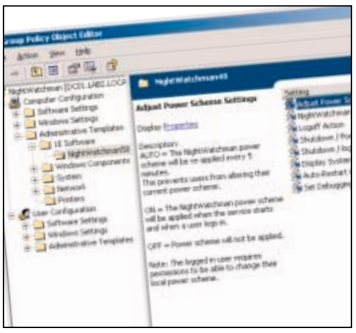
Smoothwall Smoothguard 1000-UTM
Price: £3,231.25
Reviewed: September 2007
www.smoothwall.net
Web code: 2194393
A comprehensive array of security tools, load balancing and failover facilities and extensive reporting options, mean this network security device justifies the high price.

ALTERNATIVE

Webroot Antispyware Corporate
£22.56 www.webroot.com Web code: N/A
At this price you get a one-year licence for 10 users, which is great value. It also covers two key client security bases in one go.

NETWORK MANAGEMENT

1E Nightwatchman
Price: £14.10
Reviewed: March 2008
www.1e.com
Web code: 2207429
This piece of software costs very little but could save you a lot. Using simple command-line controls, it will close applications on the PCs on your network and then shut the machines down to cut your energy bills.



ALTERNATIVE

Prefix IT PrefixNE
£Up to 2.94 per PC per month www.prefixit.com Web code: 2205651
Easy to install and use, this network management application lets you keep track of all the kit on your network and is perfect for small businesses.

COLLABORATION SOFTWARE

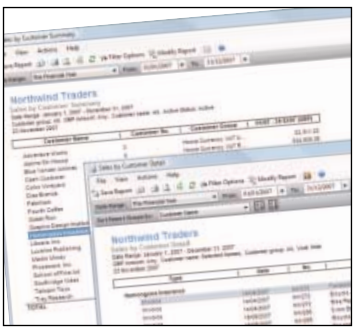
Nuance PDF Converter Professional 5
Price: £99
Reviewed: June 2008
www.nuance.co.uk
Web code: N/A
It may often take second billing to Adobe Acrobat, but this latest release is cheaper and just as good, if not better. The only problem is there are so many new tools to learn.

ALTERNATIVE

C2C Archive One Policy Manager
£40 www.c2c.com Web code: 2212370
This is a well-conceived and easy-to-implement Exchange storage management tool that can enhance performance and even reduce costs.

BUSINESS ACCOUNTS SOFTWARE

Microsoft Accounting 2008
Price: £149
Reviewed: February 2008
www.samsung.co.uk
Web code: 2207529
A late entrant to the UK accounting market, Office Accounting 2008 is easy to use, feature-rich and will shake up the competition. It also offers in-depth integration with Outlook 2007 Business Contact Manager.



ALTERNATIVE

Intuit Quickbooks Pro 2008
£299 www.quickbooks.co.uk Web code: 2203178
A sensible update to what is one of the most accessible and easy to master small-business accounting packages around, including syncing with Outlook.

NETWORK ATTACHED STORAGE YOU CAN RELY ON

TeraStation Pro II Rackmount ™

TS-RHTGL/R5, Capacities 1TB, 2TB, 4TB

- 2 U 19" Rackmount NAS
- High Speed Data Backup with included Software
- RAID 0, 1, 5, 10 and Standard
- Quick Swap Hard Drive Trays
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The TeraStation Pro II ™ is best suited to professional users who require a reliable RAID based Network Attached Storage solution with robust features. This cost-effective solution offers business-class features including Active Directory Integration, DFS Support, Heavy-Duty Power supply and cooling system, quick swap SATA hard drives, and a gigabit Ethernet connection.

dabs.com PC WORLD Business MISCO Insight

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Personal Computer World

How we test

Performance testing is an important part of *PCW*'s reviewing process, and to obtain our authoritative results we use the UK's best PC testing resource. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs

At the core of our PC performance tests are industry-standard benchmarks from Bapco and Futuremark. Sysmark 2007 Preview is the latest Vista-compatible version in a long line of Bapco benchmarks and it allows us, for the first time, to compare the application performance of Windows XP and Windows Vista-based systems with the same benchmark. It tests real-world application performance by running a series of scripts to mimic authentic user tasks. It loads and runs full versions of 14 market-leading applications, which are:

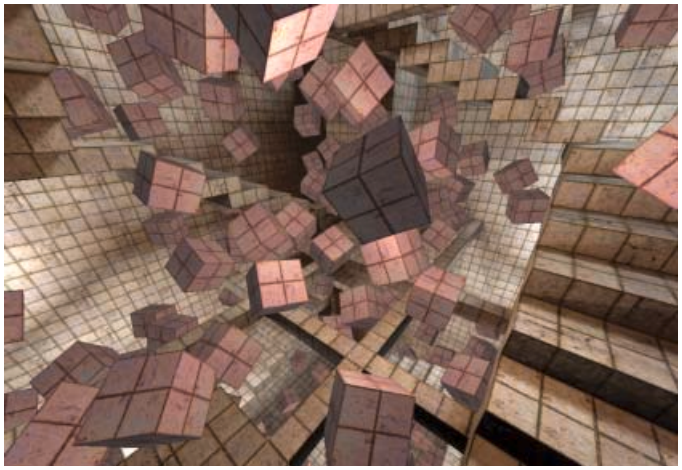
- Adobe After Effects 7
- Adobe Illustrator CS2
- Sketchup 5
- Adobe Photoshop CS2
- Autodesk 3ds Max 8
- Sony Vegas 7
- Macromedia Flash 8
- Microsoft Excel 2003
- Winzip 10
- Microsoft Outlook 2003
- Microsoft Powerpoint 2003
- Microsoft Word 2003
- Microsoft Project 2003
- Microsoft Windows Media Encoder 9 series

Note that scores from Sysmark 2007 Preview are not comparable to scores from previous versions of Sysmark. All scores are relative to the Sysmark reference machine, which scores 100 (see below for details).

In *PCW's* labs, our staff have over 20 years of combined testing experience. We know all the perils and pitfalls of practical benchmarking, and we contribute to the development of industry-standard benchmarks through our full membership of Bapco (**www.bapco.com**), the non-profit benchmark consortium. Listed below are the main benchmarks we use for testing PC systems and components.

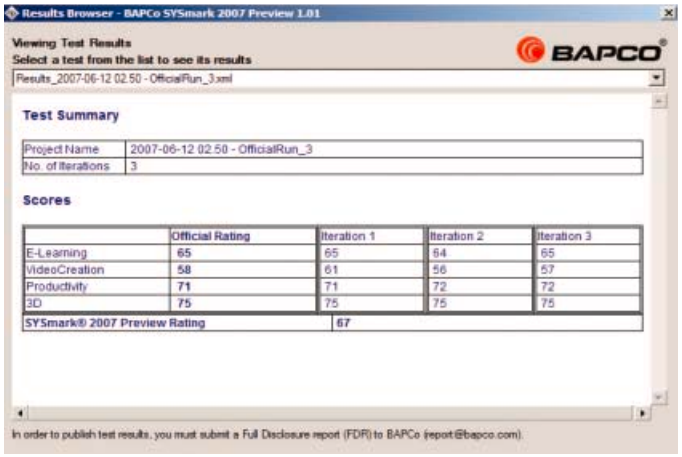
- Bapco Sysmark 2007 Preview – an application-based benchmark that tests real-world system performance.
- Futuremark 3Dmark06 – the latest version of 3Dmark that tests DirectX 3D graphics performance.
- Games – we use built-in benchmarks in Far Cry and Fear to see how graphics cards perform in a real-world games.
- Futuremark PCmark05 – a synthetic benchmark used to test the performance of a PC's major subsystems.
- Test beds – we use standardised AMD and Intel-based test rigs to test components and peripherals.

There's more information about our testing procedures and benchmarks on our Labs site at **www.reportlabs.com/testbed/bguides/benchmarks.php**.



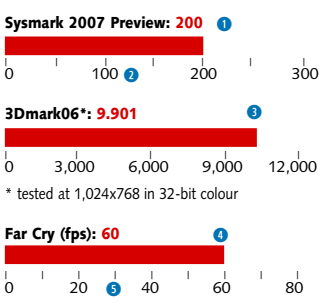
PCmark05 measures memory, processor, graphics and hard drive performance

3Dmark06 is used to test 3D graphics performance



Sysmark 2007 Preview tests real-world performance using common apps

Performance



❶ **A score of 200 indicates that the system is twice as fast as the reference PC.**

❷ **The reference PC (Intel Core 2 Duo E6300 1.8GHz, 1GB Ram) scores 100.**

❸ **An Nvidia Geforce 8600GT would score in the region of 9,900.**

❹ **Fear: A score of 60fps (frames per second) or higher is most desirable.**

❺ **A result of 30fps or above means the machine can produce playable frame rates at the tested resolution.**

Only serious players need apply

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EVGA OCZ intel Core 2 SLI X-Fi

FSP GROUP

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Overclockers UK www.overclockers.co.uk

MicroDirect www.microdirect.co.uk/

Tailoredsystems www.tailoredsystems.co.uk

Scan Computers www.scan.co.uk

Vaultec Computers www.vaultec.co.uk/FSP

FSPLifeStyle.com

ON TEST

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Garmin Etrex Vista HCx
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Editor's Choice

'An outdoor unit needs to be more rugged so that it can cope with rain, snow and the occasional stumble along the way'

The great outdoors

With an outdoor sat nav you can explore the countryside like never before. Cliff Joseph gives six models a run for their money

Anyone who drives a lot probably has a GPS satellite navigation system (sat nav) in their car, but these devices have many other uses. More and more people are also using them for various outdoor activities.

There are quite a few differences between in-car and outdoor sat-nav devices, though. The first thing you'll notice is that outdoor models tend to be quite a bit more expensive than their in-car counterparts. That's because an outdoor unit needs to be more rugged so that it can cope with rain, snow and the occasional stumble along the way. The design also needs to be heavily modified so you can hold and control the unit with just one hand – even when you're wearing thick gloves.

You'll probably end up buying additional maps, too, as the standard basemaps provided with most sat-nav devices are, in effect, conventional roadmaps that provide little information about the open countryside you'll be exploring. However, a good outdoor sat nav could, quite literally, turn out to be a lifesaver in the event of an accident, so it's a worthwhile investment for people who like to wander far from the madding crowd.

Garmin Colorado 300

Price £399.99 **Contact** Garmin 023 8052 4000 www.garmin.co.uk

The Colorado 300 is one of Garmin's latest top-of-the-range models. It's fairly expensive at £399.99, but it's tough, well-designed, and crammed with features (it's also much cheaper if you shop around online).

The Colorado is solidly built, waterproof and cleverly designed. There are just two buttons on the front of the unit, plus a scrolling wheel control device – similar to that on an iPod, but padded with tough rubber to cope with outdoor conditions. This makes it easy to hold the unit in one hand and control all its features with just your thumb. The big GPS aerial sticking up out of the corner provides extra-sensitive reception, so it should be able to pick up the GPS signal even if you're thrashing your way through thick jungle undergrowth.

The Colorado includes a complete worldwide street-level basemap to get you started, although at this price a few additional off-road maps would be welcome. It also includes a program called Trip Manager that lets you plan trips and create waypoints using the larger screen of your computer before transferring the information onto the Colorado via USB.

As well as the usual options for planning trips and creating waypoints, the Colorado includes a compass (that can even detect the direction you're facing when you're standing still), elevation plotting, odometer, and an assortment of added extras, such as a calendar, calculator and stopwatch.

The 3in screen isn't the largest in this group, but it's clear and sharp when viewing maps and other options. Our only real complaint about the Colorado is that the backlight for the screen could have been a bit brighter.

It's probably overkill for the casual hiker, but the Colorado 300 is ideal for experienced adventurers who like to explore the wilder depths of the countryside.

Verdict

Pros Extremely rugged design; good control system; wide range of features
Cons Expensive; no topographic maps included
Overall It's expensive, but the Colorado 300 is tough enough and versatile enough to cope with the most rugged outdoor conditions

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★★☆

Garmin Etrex Vista HCx

Price £279.99 **Contact** Garmin 0238 052 4000 www.garmin.co.uk

The Etrex Vista HCx is the more casual alternative to Garmin's Colorado 300, aimed at hikers and other people who don't need such a rugged or sophisticated GPS device.

It's an extremely small unit, barely 11cm tall, 5cm wide and just over 3cm thick, and weighing a mere 156g. It's quite sturdily constructed, though, with tough rubber trim to protect it from bumps and knocks. The large buttons can all be easily pressed with your thumb, and there's a mini joystick just above the screen that can be used to move around maps and navigate through the various menu options.

The unit snaps to life quickly, generally getting a good lock on the GPS satellite system in about 15-20 seconds. You can then cycle through the various screens by pressing one of the other buttons on the unit. As well as the main map screen you can quickly view options, such as the compass, or activate the Tracklog, which monitors your progress. The Tracback option lets you retrace your path once more.

It's not designed as a sports GPS, but it does have a stopwatch, along with a calendar and calculator. It's even got a 'Hunting and Fishing' option that tells you when you've found a good hunting spot – obviously aimed at Marlborough Man wannabees.

We do have a couple of small complaints, though. The manual isn't very helpful and first-time users might find themselves randomly clicking buttons for a while just to see how everything works.

And, as with most of these units, the basic roadmaps provided with the Vista aren't designed for off-road use, so you'll need to buy Garmin's Map Source range of add-on topographic maps to really make the most of the unit. However, the sturdy and compact design of the Vista HCx still makes it a useful companion for those long cross-country hikes.

Verdict

Pros Rugged design for outdoor use; compact and easy to use
Cons Small screen doesn't show much detail; no topographic maps included
Overall A little pricey, but still a good option for the casual hiker

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★☆☆

Magellan Explorist 210

Price £175.99 **Contact** Elite UK Electronics 08704 03 02 www.eliteukelectronics.com

The Explorist 210 is definitely showing its age a little, but it's still an excellent entry-level GPS for first-time users, or people who don't want to spend £200-£300 on one of the more expensive devices on offer from its rivals.

Priced at around £175, the Explorist 210 is the cheapest unit in this group. It's light, but quite tough, so it's fine for weekend hiking and trekking.

The eight buttons on the front of the unit might look a little confusing at first, but they're all clearly marked, so you can easily use them to zoom in and out on maps, mark waypoints, or quickly hit the Goto button to check a particular location.

The relatively low price does involve one big compromise, though, which is the use of a greyscale screen rather than the more attractive colour screens found in all the other devices in this group.

The reddish cast of the backlight is a bit odd, too, though it does at least improve the screen's visibility in poorer lighting conditions. Our other minor complaint is that the unit is slow to start up, taking a good couple of minutes to lock on to the GPS signal and get a fix on our location.

A full worldwide basemap is provided with the Explorist. This doesn't include much off-road information or detail, but it does have a reasonable number of points of interest, so you can quickly pick up information on local parks and other places of interest. There is also a compass included for the more experienced navigator.

Admittedly, you can get in-car GPS systems with larger colour screens for a lot less money than this. But if you're looking for a tough, handheld GPS for outdoor use, then the Explorist 210 is one of the more affordable options currently available – even if it is a bit basic and lacking in sophistication.

Verdict

Pros Compact; tough design; low price for an outdoor GPS
Cons Slow startup; greyscale screen
Overall The least sophisticated device in this group, but still a reasonable entry point for newcomers to GPS devices

Features	★★★☆☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Magellan Explorist 600

Price £327.99 **Contact** Elite UK Electronics 08704 03 02 www.eliteukelectronics.com

As the name implies, the Explorist 600 is the big brother of the entry-level 210 model. Not surprisingly, the two models share the same basic design, although there are a number of major differences – most notably, of course, the £327.99 price tag of this more expensive model.

The Explorist 600 has the same compact, handheld design as the 210, along with the same set of eight buttons on its front panel – all clearly marked so you can quickly zoom in and out, mark waypoints, and cycle through the various menu screens. The black plastic casing is an obvious difference, though, as is the colour screen on this model, which is obviously easier on the eye than the greyish screen of the Explorist 210.

Another pleasing difference is that the Explorist has a built-in rechargeable battery – something that even some of its most expensive rivals lack. One disappointment, though, was discovering that the Explorist 600 shares the 210's relatively slow startup time, taking a leisurely two minutes to get a good fix on the GPS signal. It's also a shame that such an expensive unit doesn't include some topographic maps as standard.

While it's pretty tough, the Explorist 600 isn't quite as solidly built as some of the other models in the £300+ price range, such as the Active 10 or Colorado 300. It should be perfectly adequate for hiking in the country, but we'd be inclined to opt for one of these other models if we were trekking across rocky or mountainous terrain.

If you're planning a really challenging trip across difficult terrain, then we'd recommend one of the more rugged models in this group. However, the Explorist 600 is a good – if somewhat pricey – option for more casual hiking and trekking trips.

Verdict

Pros Better screen than the 210 model; rechargeable battery
Cons Expensive; small screen
Overall A good outdoor GPS, but not as rugged as some of the other models in this price range

Features	★★★☆☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Road Angel Adventurer 7000

Price £279.99 **Contact** Road Angel 01327 855 586 www.roadangel.co.uk

Unlike all the other GPS devices in this group, Road Angel's Adventurer 7000 doubles up as both an outdoor GPS and an in-car navigation system. We were a little sceptical about this at first, as the Adventurer's widescreen design does look as if it would be more at home on a car dashboard. In contrast, all its rivals have a narrower, more upright, design that is intended to be held in the palm of your hand. It also has a touchscreen control system, just like the one you would find in an in-car system.

The touchscreen raises a potential problem since it's not going to be as rugged as Action Man devices such as the Garmin Colorado or Satmap's Active 10. If you're planning a trek across rocky terrain, you would definitely be better off with one of those more robust models.

However, the Adventurer has been designed with outdoor use in mind; it's both waterproof and solid enough to cope with a hike across most open countryside. It also boasts one important feature that sets it apart from all its rivals: it's the only outdoor GPS in this group that includes a good set of topographic maps, courtesy of Memory-Map.

In addition to its UK and Eire street maps for car navigation, it also includes a 1GB SD memory card loaded with 1:50,000 Ordnance Survey Landranger maps of all the UK's national parks.

This dual-purpose approach does make sense, as you could drive into the countryside using the Adventurer as your in-car sat-nav system and then remove it when you reach your destination, taking it with you as you hike around the countryside. Admittedly, it could be a little more solidly built, but its versatility will appeal to many weekend hikers, while its preloaded Ordnance Survey maps provide better value for money than any of its more rugged rivals.

Personal Computer World EDITOR'S CHOICE

Verdict

Pros Versatile in-car and outdoor design; bundled OS maps provide good value for money

Cons Not as rugged as some of its rivals; widescreen design not ideal for a handheld unit; £3.99 monthly subscription charge

Overall It could be a bit more rugged, but the versatile Adventurer 7000 is good value for money

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★½

Satmap Active 10

Price £299.99 **Contact** Satmap 0845 873 0101 www.satmap.com

Satmap's Active 10 claims to be the ultimate GPS device for sports and outdoor activities. It's certainly an impressive device, and in some ways closer to a full-scale PDA than a mere GPS device.

It uses Windows CE as its operating system and is equipped with an ARM 9 processor and 128MB of memory. It has a high-quality 3.5in screen that works well when viewing photos of points of interest. It can even double as an MP3 player if you use its SD card slot to transfer music files across from your PC.

The Active 10 is waterproof and solidly built, although we did find the shiny plastic cover that sits over the screen is easily marked; replacement covers are available at £15 for a pack of three.

Using the Active 10 is fairly straightforward. The set of six buttons placed around the edges of the unit are a little fiddly, but like several of these units it also has a small joystick that allows you to navigate around maps and select menu options fairly quickly.

The unit uses three AA batteries, but we can't help thinking that, for this price, a rechargeable battery might have been included as standard. An optional Power Bundle, which includes a rechargeable battery, mains and car adapters costs an additional £44.99.

The standard map supplied with the Active 10 is fairly basic, too – a simple roadmap of the UK. Satmap does sell a wide range of additional maps, including national parks and trails, and various counties. They're not too expensive, starting at around £29.99, although some of the more detailed premium maps can cost over £100.

The Active 10 is a well-designed outdoor GPS. It's not the cheapest option in this group, but its rugged design and high-quality screen definitely make it one of the more attractive units for the hardy outdoor walker.

Personal Computer World RECOMMENDED

Verdict

Pros Very solidly built; high-quality screen; wide range of GPS features

Cons Expensive; only includes basic street-level maps

Overall Powerful hardware and features justify the unit's high price

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★½

A voyage around sat-nav devices

Each sat-nav device works in a different way and is suitable for different users, so take a trip around the two winners of this group test, Road Angel's Adventurer 7000 and Satmap's Active 10

The small menu bar at the top of the screen lets you zoom out, plan routes and get detailed map information. However, their relatively small size means you'll most likely need to use the stylus to operate them.

The Road Angel shuns physical buttons in favour of a 3.5in touch-screen display. This means you can either use your fingers to operate the device, or the included stylus, which slides neatly into the rear of the chassis.

The SD card slot for the maps sits on the side of the chassis behind a rubber flap. A USB port is housed on the other side of the device.

Like the Active 10 (below), the Adventurer 7000 features Ordnance Survey (OS) maps. You get OS maps for the UK's national parks included in the pack – further OS maps for the rest of the country are optional extras.

The Road Angel's chassis isn't as robust as some of the other devices on test, but it will be able to withstand moderate outdoor usage and features a case that's water resistant. The square, in-car design also means it's not as comfortable to hold in the hand compared to competing products.

Basemaps for the UK are included, which allow for basic road-based navigation, so you'll need to invest in some OS maps. Satmap sells both 25,000:1 and 50,000:1 maps covering various regions of the UK, starting at £29.99.

The Active 10 runs off three AA batteries. Although these won't last as long as a lithium-ion battery, it does mean that you can easily carry spares with you so you can replace the batteries should they die while you're out on a hike.

A plastic cover is used to protect the display from scratches and scrapes. Replacement covers can be purchases from Satmap at a cost of £15 for a pack of three.

The function of the six rubber buttons depends on which menu you are in. They can be a little fiddly to use, though, and require a firm push.

This small joystick lets you quickly navigate around the maps. It also doubles up as a button, so you can use it to select menu options. Despite its small size, it can be easily operated with gloves on

Maps courtesy Ordnance Survey mapping
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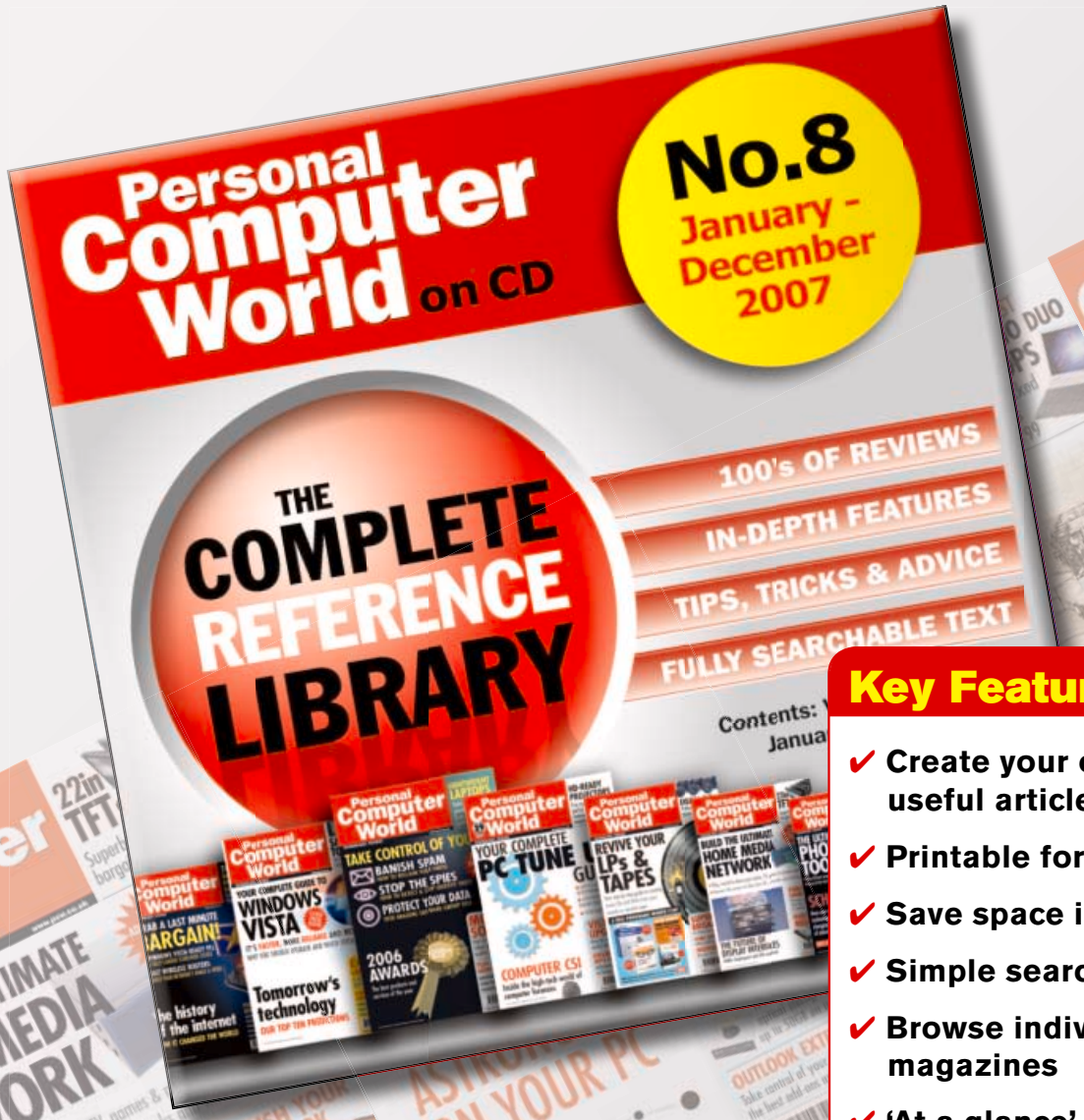

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Outdoor sat-nav devices

MANUFACTURER	**GARMIN**	**GARMIN**	
Model	Colorado 300	Etrex Vista HCx	
Price	£399.99	£279.99	
Manufacturer URL	www.garmin.co.uk	www.garmin.co.uk	
UK sales URL	As above	As above	
Sales number	023 8052 4000	023 8052 4000	
SPECIFICATIONS			
Screen size (diagonal)	3in	2.25in	
Resolution	240x400	176x220	
Waterproof	✔ (IPX7)	✔ (IPX7)	
Built-in Ram	348MB	N/A	
Colour screen	✔	✔	
Memory slot	SD card	Micro SD card	
Waypoints	✔	✔	
Create routes (maximum)	✔	✔	
Create goto points	✔	✔	
Create points of interest	✔	✔	
Proximity alerts	✔	✔	
Built-in compass	✔	✔	
Track log	✔	✔	
USB interface	✔	✔	
Power supply	2 AA	2 AA	
Estimated battery life	15hrs	25hrs	
Maps included	Worldwide Basemap	Europe/Atlantic Basemap	
Price of additional maps	From £50	From £50	
Bundled software	Trip Manager	Trip Manager	
Bundled accessories	Belt clip	Wrist strap	
Dimensions in cm (wxdxh)	6x3.5x13.9	5.6x3x10.7	
Weight	207g	156g	
SCORES			
Features	★★★★☆	★★★☆☆	
Performance	★★★★☆	★★★★☆	
Value for money	★★★☆☆	★★★☆☆	
OVERALL	★★★★☆	★★★☆☆	

	MAGELLAN	**MAGELLAN**	**ROAD ANGEL**	**SATMAP**
	Explorist 210	Explorist 600	Adventurer 7000	Active 10
	£175.99	£327.99	£279.99 (includes 6-month subscription; subsequently £3.99 per month)	£299.99
	www.magellangps.com	www.magellangps.com	www.roadangel.co.uk	www.satmap.com
	www.eliteukelectronics.com	www.eliteukelectronics.com	As above	As above
	08704 03 02	08704 03 02	01327 855 586	0845 873 0101
	2.25in	2.25in	3.5in	3.5in
	122x160	122x160	320x240	320x240
	✔ (IPX6)	✔ (IPX7)	✔ (IPX6)	✔ (IP65)
	22MB	16MB	64MB	128MB
	Greyscale	✔	✔	✔
	SD card	SD card	SD card	SD card
	✔	✔	✔	✔
	✔	✔	✔	✔
	✔	✔	✔	✔
	✔	✔	✔	✔
	✔	✔	✔	✔
	✔	✔	✘	✔
	✔	✔	✘	✔
	✔	✔	✔	✔
	2 AA	Li-ion	Li-ion	3 AA
	18hrs	17hrs	8hrs	12hrs
	Worldwide Basemap	Worldwide Basemap	UK/Eire Basemap, UK national parks Ordnance Survey maps	UK Basemap
	(UK pricing not yet set)	(UK pricing not yet set)	From £50	From £29.99
	Geocache Manager	N/A	Memory-Map, photo viewer, MP3 player	N/A
	N/A	N/A	Car-mounting kit; mains power supply	Carrying bag; detachable strap
	5.6x3.3x11.9	5.6x3.3x11.9	8.89x2.3x7.4	7.5x3x13
	165g	165g	175g	175g
	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆
	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆
	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆
	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆

Galileo, Galileo – GPS takes over the world

Sales of sat-nav devices are booming. Almost 30 million sat-nav devices were sold worldwide in 2007, and it's estimated that the sat-nav market in 2008 will be worth as much as $30bn (£15bn).

Most of those GPS devices will be in-car systems, but GPS features are increasingly being built into mobile phones and spreading into other areas as well. The outdoor models reviewed here are becoming more and more popular, as are sports or fitness devices designed for running, cycling and other sports. As well as allowing you to plan your route and keep track of your location, these devices often include other features, such as the ability to record lap times, heart rate and even the number of calories you burn along the way.

However, GPS isn't stopping there. Sportswear specialist O'Neill has developed a skiing jacket called the Navjacket (**www.navjacket.com**), which has a GPS receiver built into it, along with a flexible organic LED built right onto the sleeve of the jacket so that you can glance down at the screen on your arm without even pausing as you hurtle down the piste. There was even a GPS dog collar on show at the recent Crufts dog show in the UK.

However, one of the biggest growth areas for GPS is people tracking. There are many devices being developed that are designed to help parents keep track of their children, or other family members such as elderly relatives.

At the recent Consumer Electronics Show in Las Vegas, one health company unveiled a set of GPS trainers. These were aimed at people suffering from Alzheimer's – the idea being that they can be located if they wander off or forget where they are.

And the sat-nav boom is likely to continue. At the moment, all sat-nav devices rely on a satellite system that was set up and controlled by the US military. To ensure independence from the US system, the European Union is developing its own GPS satellite system called Galileo, while Russia is working on its own Glonass system. With all that GPS hardware floating over our heads, you can bet that more and more GPS products and services will be developed over the next few years in order to make use of it all.

Garmin's Forerunner 305 uses GPS to work out distance travelled and calories burnt

Editor's Choice

Editor's Choice Road Angel Adventurer 7000
Recommended Satmap Active 10

Road Angel Adventurer 7000

Satmap Active 10

We were a little surprised at how expensive these outdoor GPS devices are. With prices starting at £175.99 and going up to almost £400, they're certainly more expensive than their in-car counterparts – and most are only equipped with basic roadmaps that won't be much help for people who are hiking across the countryside. This means you'll need to pay for additional off-road maps as you embark on your adventures.

The least expensive model sent in for review was Magellan's Explorist 210, priced at £175.99. But while this has all the standard features you'd expect from a sat-nav system, such as the ability to plot waypoints and plan routes, the unit's black and white screen is unattractive and feels rather basic. Its bigger brother, the Explorist 600, does have a more attractive colour screen, but at well over £300 it's a lot more expensive than the similarly designed Garmin Etrex Vista HCx.

For £299.99 you can get Satmap's Active 10, which has a larger screen and a rugged design that will withstand tough outdoor conditions. The arrangement of the buttons on the Active 10 is a little cumbersome, but it certainly provides a good range of navigation features, and the additional maps sold by Satmap are reasonably priced. All of which combines to win it our Recommended award. However, the award for the roughest, toughest outdoor GPS has to go to the Garmin Colorado 300. This is a device that will stand up to some extreme conditions, while it also benefits from a simple and intuitive control system. But at £399.99, it is by far the most expensive model reviewed here.

This brings us to the odd man out: Road Angel's Adventurer 7000. Designed as a dual-purpose, in-car and outdoor sat nav, the Adventurer is great value for money. It includes a car-mounting system, mains power supply, 3.5in screen and rechargeable battery for £279.99. There is also a set of Ordnance Survey maps for the UK's national parks. It's not as rugged as the Colorado 300 or Active 10, but it's the most versatile option for the hiker who needs a bit of help while trekking around the countryside, so it collects the Editor's Choice award. **PCW**

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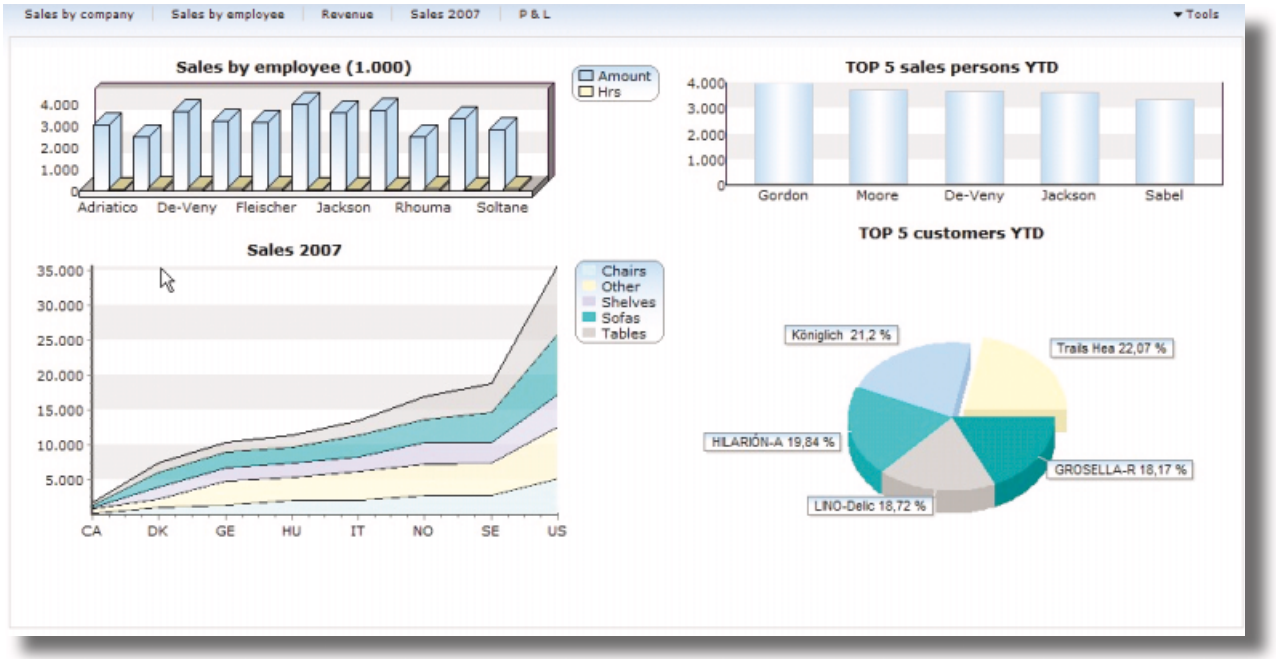

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Radeon HD3870 X2

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256-bit GDDR3/GDDR4 memory interface

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ON TEST

100 ACD Systems ACDSee Photo Editor 4
101 Adobe Photoshop Elements 6
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110 The urge to merge
Editor's Choice

'Digtal SLRs are becoming more affordable and we're all looking for new ways to experiment with our photos and improve them'

Digital darkroom

Even the best photographers need image editors to tweak their photos. Ken McMahon takes a snapshot of the market

Digital photography is everywhere you look. Cameras in phones and other handheld devices are getting more sophisticated, digtal SLRs are becoming more affordable and we're all looking for new ways to experiment with our photos and improve them.

We've grown to expect certain things from photo-editing software as standard. One-click photo enhancement, easy red-eye removal and effective noise filters along with seamless retouching and cloning tools are now expected in even the most basic packages. Some are even available online for free.

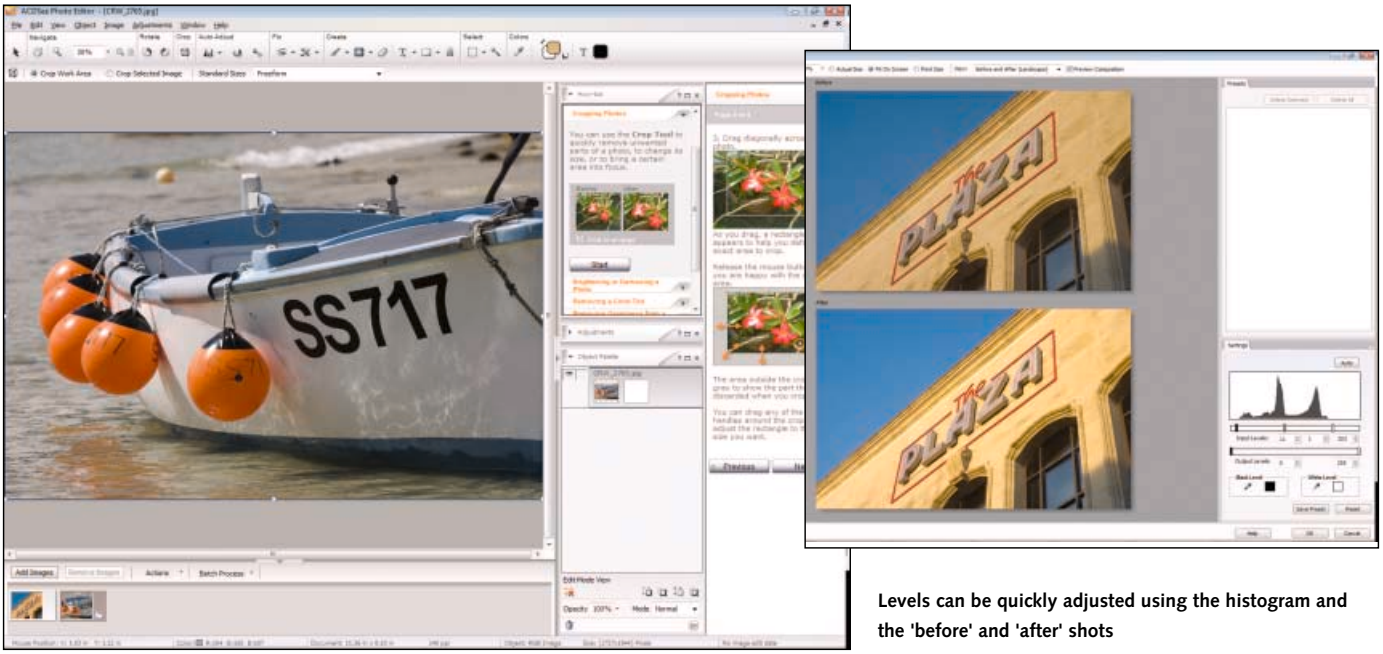
As a result, software vendors are having to raise their game. A case in point is Adobe Photoshop Elements 6, which lets you combine several photos to produce one that contains the best elements of all of them.

Photo merging can also help you get well-exposed details in difficult lighting situations by combining several 'bracketed' shots made with different exposure settings to produce high dynamic range (HDR) images.

Software companies are trying to attract photographers across the spectrum from casual point and shooters to digital SLR owners with new features like these. In this group test we put six photo-editing packages aimed at the home user to the test, ranging in price from free to £79.

ACD Systems ACDSee Photo Editor 4

Price £24.99 **Contact** ACD Systems www.acdsee.com



Levels can be quickly adjusted using the histogram and the 'before' and 'after' shots

ACDsee is bucking the trend for combining photo-editing and management tools in one application. Photo Editor 4 does just that, editing. If you want to organise your photo library you'll have to pay extra for ACDSee 10 Photo Manager. Having said that, Photo Editor is around half the price of some of the other applications in this group test and there's a special bundle price for the two applications on the ACDSee website which still comes in well below £50. So the choice is yours and it's good value either way.

So to the Editor which, at first glance, has a bit of a retro look about it. The central image window is surrounded on three sides by a toolbar, image basket and on the right a palette dock containing how-to guidance, adjustment filters and an object palette.

Expanding the how-to palette reveals ACDSee's hidden treasure: a stack of guided projects covering the gamut from basic editing (opening and rotating photos) to photo fixing and creative projects.

Each one kicks off with a short introduction before taking you step-by-step through the task. Guided help is often a pretty cursory, click this, do that affair, by contrast ACDSee's how-tos are well written, informative and full of useful tips. In spite of the title, they don't simply tell you how to do something, but why, and advise you of other things you might want to try as well. We also appreciated the way menu items and tools you need are helpfully highlighted on the menu and toolbars, making them very easy to locate if you're unfamiliar with the interface.

Once you get beyond the guidance, ACDSee Photo Editor has the look, feel and facilities of a fairly well-equipped mid-range photo-editing application. It has many of the image-adjustment tools and effects filters found in Photoshop Elements and Paint Shop Pro Photo X2 including features such as object layers complete with blend modes and masks.

Photo Editor's selection tools could be improved. There's a selection of geometric marquees and a magic wand tool, but there are no intelligent selection or masking tools to help you isolate a subject from the background. We also couldn't find any means of selecting pixels on the basis of colour, so if you want to replace certain colours in a photo you'll soon come unstuck. For example, there isn't a simple way to turn your red car green or adjust only the skin tones in a specific photo.

Applying adjustments such as colour balance is made simple by the use of thumbnail variations providing alternative options. However, if you prefer it's also possible to perform this in the conventional way using RGB sliders. All adjustments are carried out in a modal dialogue box with big before and after previews and the option to save and apply your own presets. There's a comprehensive set of tonal adjustment tools including those to tinker with levels, curves and both shadows and highlights.

What it does, ACDSee Photo Editor does very well, and if you are looking for a competent application that will take you from beginner to intermediate digital photo editing then this package will suit you well. What it may lack in killer features such as makeover tools and multiple image merging, it makes up for by providing a solid image-editing feature set and first-rate guidance. This, combined with the price of just under £25, makes it a tempting choice for newcomers to digital editing.

Verdict

Pros Solid features and adjustment tools; excellent guidance

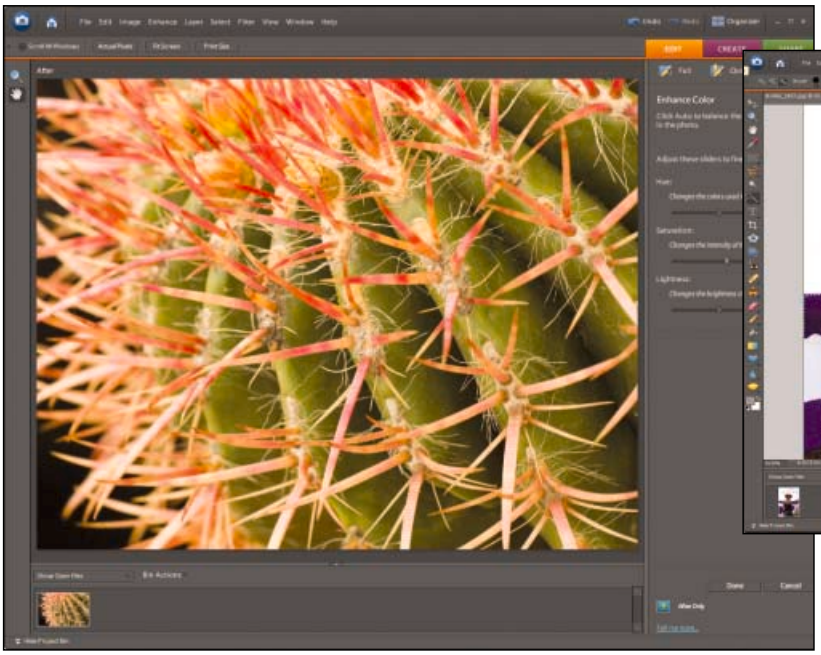
Cons Lacks 'killer features'; limited selection tools

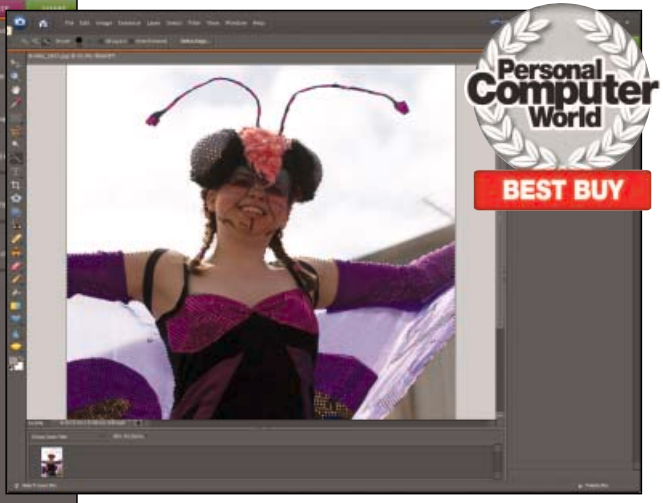
Overall Good choice for beginners who want to take their photo editing a little further

Features	★★★☆☆
Ease of use	★★★★★
Value for money	★★★★☆
Overall	★★★★☆

Adobe Photoshop Elements 6

Price £69.32 **Contact** Adobe 020 7365 0733 www.adobe.com/uk





Photoshop Elements 6 features a new interface and more guidance for digital editing

Adobe Photoshop Elements has enjoyed the position of top dog in the non-professional image-editing world for as long as most people have been taking digital cameras on holiday. But Elements isn't just for holiday snaps, as well as serious amateur photographers, the program has also found favour with many professional photographers for whom full-blown Photoshop CS3 is overkill.

In this latest version Adobe has attempted to continue to appeal to all comers by revamping the interface and including more guidance for digital editing tasks, while at the same time harnessing Photoshop's raw power to provide tools and features that will appeal to more ambitious photographers.

The first thing that will strike anyone familiar with previous versions is how different Elements 6 looks. Adobe has overhauled the interface and along with the new charcoal colour scheme it exudes a more serious, professional and complicated feel.

As before, there are essentially two applications – a photo organiser and an editing tool. The new organiser now has four tabs labelled Organize, Fix, Create and Share. Some of the one-click fixes available from the Fix tab in the Organiser do just that. Auto Smart fix, for example, runs a script that appears to apply levels and colour adjustments. If these fixes aren't doing the job you can enter the editing application in one of three working modes – Quick Fix, Full Edit, or Guided Edit, above which sit three more tabs that allow switching from editing to creating or sharing.

All these tabbed modes doubtless make everything appear well-organised, but we think new users could well be confused and maybe even a little intimidated by the plethora of tabbed panels.

Quick Fix isn't new, but it does provide a one-stop shop for many of the image-enhancing tools you're likely to need. These include Smart Fix, Red-eye Fix, lighting and colour adjustments, and sharpening. As well as having sliders for each of these, there are auto buttons that will do the guess-work for you and, at the very least, offer a start point for your own tweaking.

The new guided editing mode takes you through basic editing tasks such as cropping and straightening, correcting skin tones, retouching and using the new Photomerge features. Too often though, the guidance consists of little more than a single-sentence explanation of a slider's function. For example, Enhance Colour is a hue, saturation and lightness control with an auto option and explanations that hue 'changes the colours in the photo', saturation 'changes the intensity of the colour or hue' and lightness 'changes the brightness of the colours' – all of which becomes fairly evident when you move the sliders.

Adobe rarely fails to endow a new release with at least one great new feature and Elements 6 is no exception. Photomerge Group Shot combines several group photos to produce the perfect shot – no-one with their eyes shut or looking at their feet. Similar blending technology is employed in another new feature, Photomerge Faces. This seamlessly blends features from two or more portraits.

Adobe has also improved the already excellent Photomerge panorama feature, added a new Quick Selection tool and improved integration with the Premiere Elements video-editing application. All great new additions, but we were left wondering if, in trying to please everyone, Photoshop Elements' reputation for intuitive ease of use isn't being submerged.

Verdict

Pros Faster; great new selection and Photomerge tools

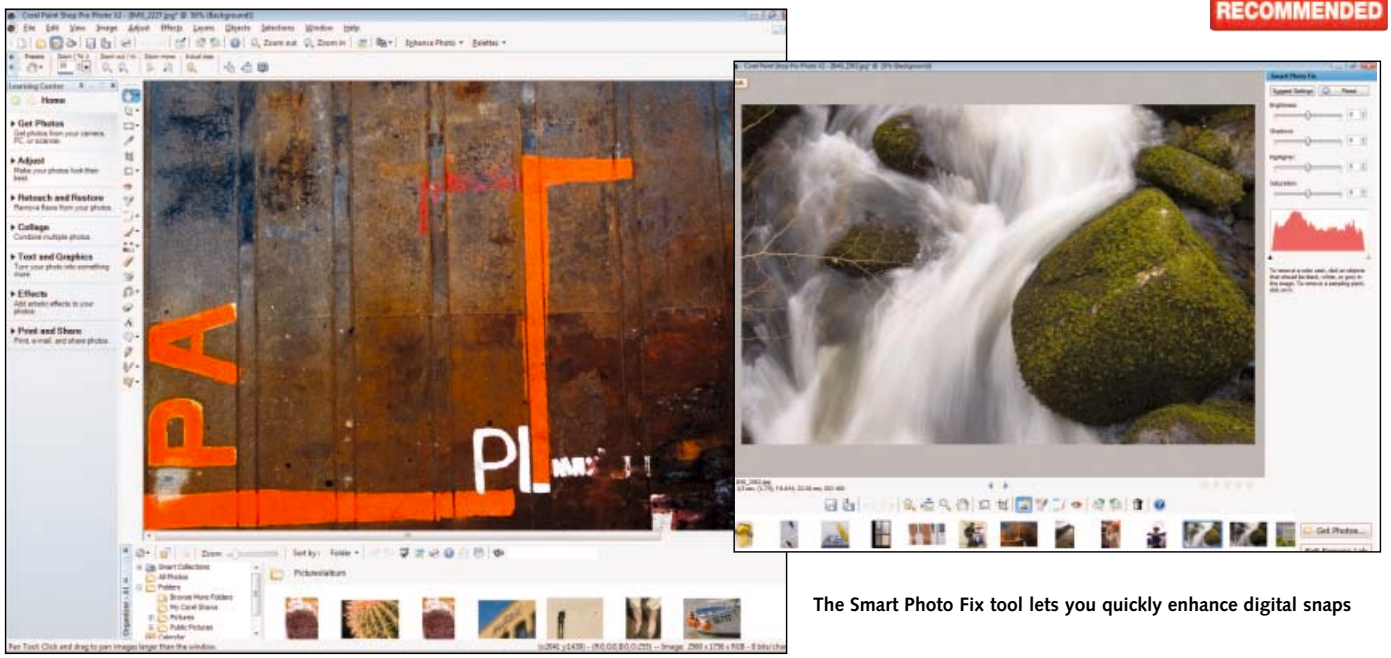
Cons Revamped interface is too involved; organiser and editor need better integration

Overall Provides great scope for digital photographers, but not as beginner-friendly as it once was

Features	★★★★★
Ease of use	★★★☆☆
Value for money	★★★★☆
Overall	★★★★☆

Corel Paint Shop Pro Photo X2

Price £79 **Contact** Corel 0800 376 9271 www.corel.com



The Smart Photo Fix tool lets you quickly enhance digital snaps

Corel's tenure of Paint Shop Pro has seen its transformation from a niche photo-editing application to something with much wider appeal. The only convoluted thing about Paint Shop Pro Photo X2 is the title; in every other respect it's easy to get to grips with, providing a good introduction to photo editing for newcomers and enough sophistication to attract serious amateurs.

Those who want to quickly get their photos sorted and move on are well catered for. There are plenty of one-step photo fixers, such as 'one-step photo fix', 'one-step noise removal' and 'one-step purple fringe fix'.

This version introduces Express Lab which allows you to quickly rate and apply basic edits such as cropping and red-eye removal to a folder of photos. Express Lab includes Smart Photo fix, an extended version of the one-step photo fix, which allows you to tweak tonal and colour settings after the software has made its best effort.

Beginners who are keen to experiment with retouching and other editing tasks will find a range of tools that are easy to use and produce fairly good results, even in inexperienced hands. The makeover tools include a blemish fixer, a toothbrush and a suntan brush.

Aside from personal makeovers, one of the most commonly undertaken retouching tasks is cloning to remove objects, but seamless cloning requires some skill and experience. Paint Shop Pro's Object Remover is easier to use than conventional cloning brushes; there's no painting involved, you just select the source and target areas. It works well with some subjects, but results can be a hit and miss.

There are enough basic and intermediate tools and projects here to keep those new to Paint Shop Pro Photo X2, or photo editing in general, busy for a long time. Corel has got the balance between ease of use and worthwhile end results about right. Guidance, in the form of the Learning Centre, a context aware panel that provides step-by-step project guidance as well as advice on the currently selected tool, is helpful and apposite without being intrusive – you can turn it off when you no longer feel in need of it.

When you get to that stage there's plenty more to explore in the form of advanced editing controls. Paint Shop Pro Photo X2 has tonal and colour controls that can match Photoshop's in range and sophistication, but some of the advanced tonal editing tools, such as histogram adjustment and highlight/midtone/shadow aren't always that intuitive.

All the adjustment tools and filters effects settings can be saved as presets, and a few existing ones are provided. But there aren't enough of them and what there is isn't always very useful. Preset libraries that correct for common exposure and colour problems would be a big step forward.

Paint Shop Pro was one of the first applications to deal with the problem of noise and its digital camera noise removal filter is superb. It also has an easy-to-use artificial depth of field effect, backlighting and fill flash effects for handling difficult lighting as well as purple fringe and chromatic aberration removal tools.

Add to that a new HDR (high dynamic range) photo-merging feature and editable layer styles for creating drop shadows, glows, bevels and the like, and you have an extremely capable photo editor that's suited to a wide range of abilities.

Verdict

Pros Suitable for both beginners and advanced users

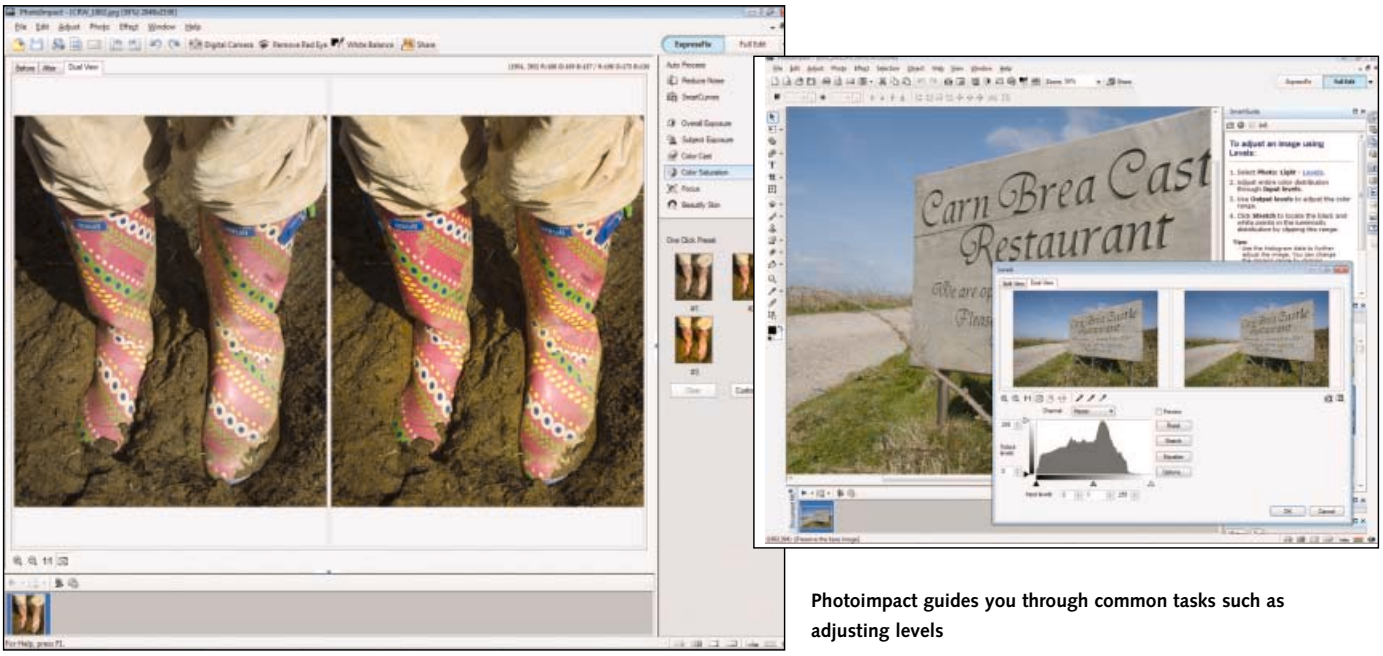
Cons Some tools difficult to fathom; lack of useful presets

Overall Inexpensive and capable alternative to Photoshop with a selection of easy-to-use features

Features	★★★★★
Ease of use	★★★☆☆
Value for money	★★★★☆
Overall	★★★★☆

Corel Ulead Photoimpact 12

Price £29.99 **Contact** Corel 0800 376 9271 www.corel.com



Photoimpact guides you through common tasks such as adjusting levels

Ulead, probably best known for its video products, developed Photoimpact to version 12 at which point it was adopted by Corel when the company acquired Ulead at the end of 2006. However, Corel wasn't really after Photoimpact, it had its eye on the emerging HD video authoring and playback markets and was primarily interested in Intervideo, which had owned Ulead since 2005.

All of which is of interest only in as much as it raises this question; what is Corel, which already has a successful photo-editing application in the form of Paint Shop Pro Photo X2, going to do with Photoimpact? The answer to that question is nobody really knows. However, if the past 18 months is anything to go by, the most likely answer is not very much at all.

That would be a shame because Photoimpact has got a lot to offer. It has a comprehensive suite of powerful editing tools that, since the last Ulead update just before the Corel acquisition, was nicely tempered with some ease-of-use features designed to make it more accessible for digital image-editing novices.

Primarily this takes the form of the Expressfix mode, which pulls together a subset of the program's features and adds some new tools designed to automate common image enhancement processes such as tonal and colour adjustments.

Big before and after previews, together with thumbnail variations of the kind used in ACDSee Photo Manager, simplify the process for those who aren't so confident when it comes to knowing their way around a colour wheel.

Photoimpact and ACDSee Photo Editor have quite a lot in common. They provide a solid set of editing tools, guided tasks and tools focused on the beginner as well as a no-nonsense full-editing interface that provides access to the program's more advanced editing tools.

But Photoimpact has a few other tricks up its sleeve that will appeal to those who want to go a little further with their photography. It was one of the first photo editors to provide high dynamic range (HDR) tools, allowing the combination of multiple bracketed exposures to produce images with very good shadow and highlight detail from difficult subjects such as window shots and sunsets. And though Photoimpact's HDR feature was one of the first to arrive on the scene, it remains one of the most versatile.

One of the big problems with merging photos to produce an HDR composite is that the camera has to be on a tripod. Even then, if the subject moves, most HDR tools simply don't know how to deal with it. But Photoimpact will happily merge handheld shots and can remove artefacts caused by subject movement either automatically, or manually by painting out moving elements with a brush.

And its Smart Remove feature, which allows you to combine several shots of the same scene and choose which bits of each to include predates Photoshop Elements' Photomerge group shot by more than a year.

Without a clear commitment from Corel, buying Photoimpact 12 inevitably involves a small element of risk for those who want to take advantage of upgrade offers on future versions. Now that Corel has cut the price of Photoimpact by half it's less of a risk than it might have been, but if you're concerned about lack of future support it might be prudent to hold off for a while and see what the future brings.

Verdict

Pros Good photo merge features and basic adjustment tools

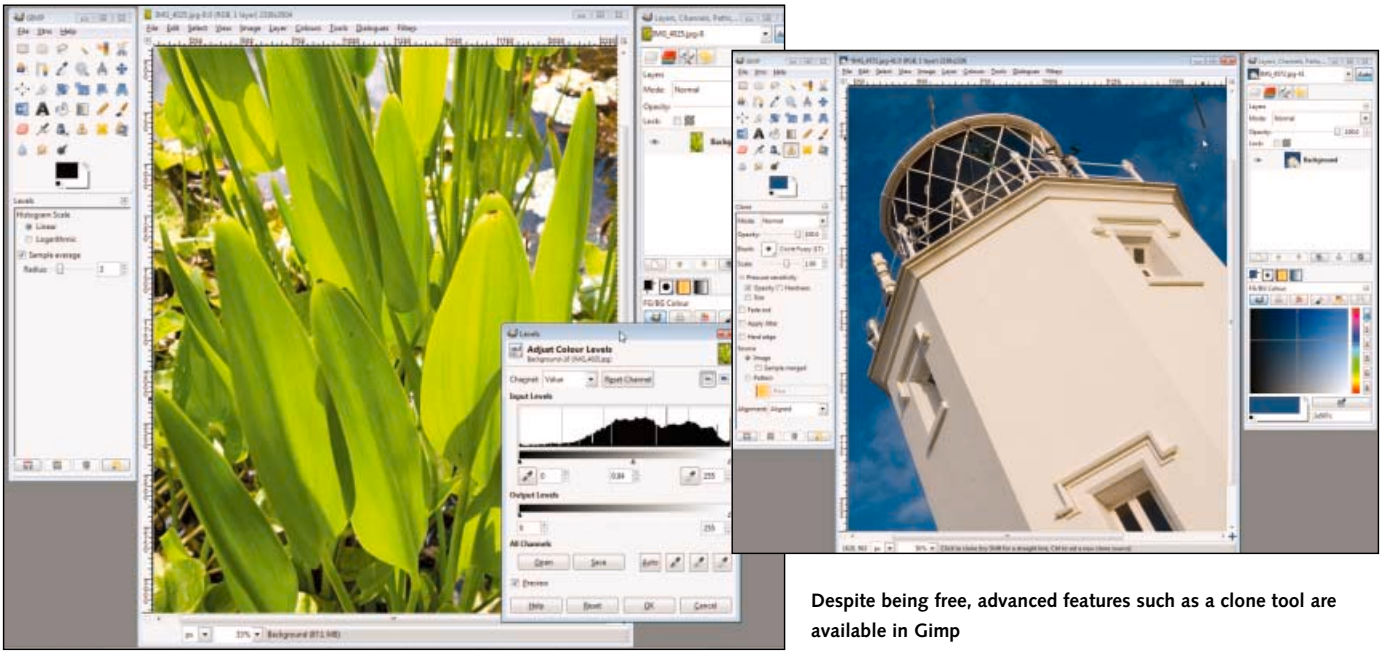
Cons Lacks advanced editing tools; no update since 2006

Overall A good-value mid-range package, but questions remain over the future of Photoimpact

Features	★★★☆☆
Ease of use	★★★☆☆
Value for money	★★★★☆
Overall	★★★☆☆

Gimp 2.4.5

Price Free **Contact** Gimp www.gimp.org



Despite being free, advanced features such as a clone tool are available in Gimp

Gimp (GNU Image Manipulation Program) is a GNU open-source project that grew out of a software project started by a couple of Berkeley students who wanted to produce an image-editing program for Unix. Gimp runs on most Unix-based operating systems, Mac OS and Windows. You can download a Windows installer at **http://gimp win.sourceforge.net/stable.html**.

It was originally designed to run in an X-Windows environment, so Gimp can seem a little anarchic compared with conventional Windows applications. Each interface element (the image window, toolbox, layers palette, etc) occupies its own window, together with a corresponding button on the taskbar. The interface provides some docking options – layers, paths, channels and history palettes can live in shared accommodation, as can brushes, patterns, gradients and fonts. This setup also has the advantage that you can arrange things how you want them. It also has its drawbacks though, and if you have other applications running you can't Alt&Tab back into Gimp – only one of its numerous windows.

Gimp has developed into a feature-rich application with an array of sophisticated image adjustment and manipulation tools to rival the best. It has numerous selection tools including marquees, intelligent edge-finding scissors, fuzzy select (also known as magic wand) and a foreground select tool. The fuzzy select tool can select anti-aliased and feathered edges, transparent areas, sample merged (from multiple layers) and from the composite image, an individual channel, hue saturation or value.

Most clone tools offer two alignment options – aligned and unaligned – but Gimp's has four. It supports a pressure-sensitive stylus input and has a clone brush for cloning from a source with an altered perspective. This would be useful for, say, cloning windows from one side of a building onto another.

The layers palette has a full complement of blend modes, opacity and transparency lock and fully featured editable layer masks. You can toggle masks on and off, make masks from selections, and copy them from one layer to another. The Gimp's layers palette was the most fully featured and versatile of all the programs in this group test. About the only thing it doesn't provide is the ability to arrange layers into groups, but doubtless that will come.

While it has an impressive array of tools, and editing features, Gimp fails to match the other applications for help and guidance. There is a comprehensive help browser which provides explanation of every aspect of the program, but if you're starting out in digital image editing with Gimp, you'll find it a bit tough to get to grips with.

One advantage of Gimp's open-source provenance is that it is packed with effects filters and there's no shortage of plug-ins. Plug-in development is so central to Gimp it has its own website, Gimp Plug-in Registry at **http://registry.gimp.org**. Here you can find everything from noise removal and layer effects to plug-ins for working with Raw file formats from digital cameras.

Despite the availability of Raw plug-ins, Gimp's inability to work with 16-bit RGB images all but rules it out for serious photographic work. But if you have some existing knowledge of digital imaging and are prepared to make some effort to find your way around, Gimp won't disappoint.

Verdict

Pros Free; powerful editing tools; well supported

Cons Complex; little guidance; 8-bit RGB only

Overall Great value, fully featured editing application, but requires real commitment

Features	★★★★☆
Ease of use	★★☆☆☆
Value for money	★★★★★
Overall	★★★☆☆

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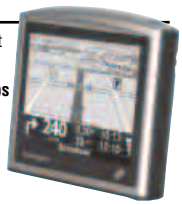

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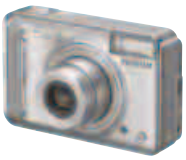

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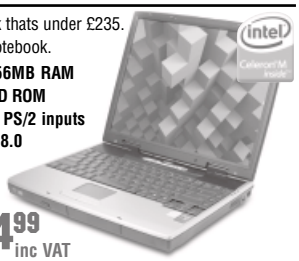

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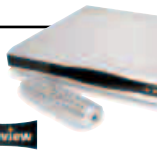

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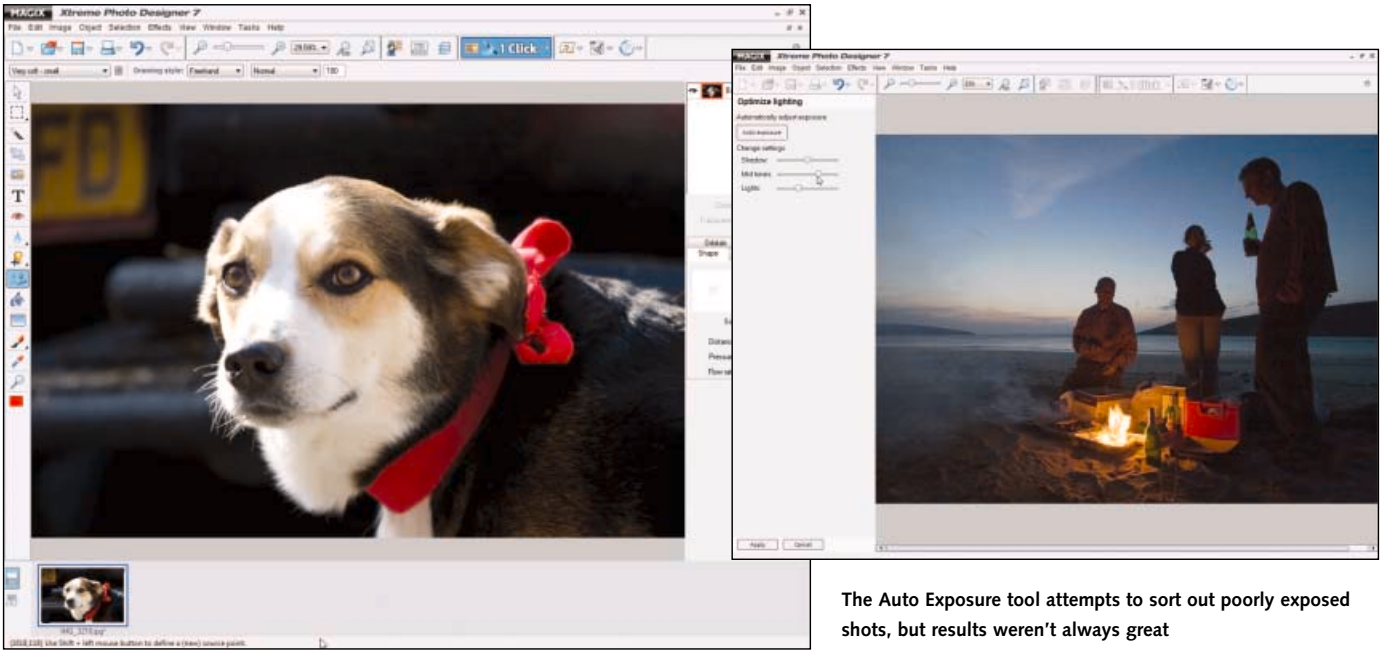


The Auto Exposure tool attempts to sort out poorly exposed shots, but results weren't always great

This suite from Magix includes Xtreme Graphic Designer and Magix Photo Manager, but we'll be concentrating on the Xtreme Photo Designer 7 element in this review. It's also available as part of the larger, more expensive, Magix Xtreme Photo Video Graphic Suite, which contains other programs including Xtreme Graphic Designer, Xtreme Movies on CD and DVD, and Xtreme Photo and Video Manager.

The main picture window sits below a horizontal toolbar and a tool options bar, a vertical toolbar on the left accommodates an assortment of basic editing tools and a filmstrip window at the bottom of the screen can be toggled to display a thumbnail effects browser.

The first thing your eye is drawn to is a '1-click' button on the horizontal toolbar which provides exposure, colour and white balance corrections via a dropdown menu. This made a reasonable job of brightening slightly underexposed photos during testing, but performed poorly with overexposure – on occasions making things worse.

The Task Assistant provides guided editing from a panel, which replaces the toolbar on the left of the screen. Projects are organised on three tabs – Optimise, Edit and Creative – with a handful of tasks on each.

The optimise exposure task assistant provides an Auto Exposure button which generated similar results to the 1-click button. Sliders are also supplied for adjusting shadow, mid tone and 'lights'. These produced quite crude results that in some cases worsened, rather than improved our test images. Dragging the 'lights' slider in either direction on bright photos caused the highlights to disappear and, even more disconcertingly, returning the slider to its original position didn't restore the image to its previous state.

Correct image focus is a sharpening tool with three settings (light, medium and hard), but there are no intermediate settings and no explanation of why, when or how you might want to use this effect.

The interface can be inconsistent in places. On the Main Task Assistant tab the exposure tool is called 'Optimise exposure' and when clicked it becomes 'Optimise lighting'; again, there's no mention of what kind of photos might need their exposure or lighting optimised, nor how. Likewise 'Correct image focus' turns into 'Correct image sharpness'. To make a selection you 'select all' or use one of the selection tools. To deselect you 'remove mask'.

Adjustments and effects are all rolled into one on the Effects menu, but are at least categorised here; in the effects browser they are lumped together, so you have to scan them all to find what you want. Most of the effects on the colour filter sub-menu of the effects menu are included. The effects thumbnails use a sample image. When you click a thumbnail it is applied to the full-resolution open image – a process that takes several seconds – before the filter controls appear. And you can't try another effect without cancelling the first.

The Clone brush provides a variety of presets and blend modes, and you can feather the brush edge and change the size and pressure, but there are no align modes. It's neither simple enough for beginners nor sufficiently sophisticated for advanced users. The Levels control provides no histogram – there is a separate histogram display, but it's modal – you can't do anything else (such as adjust levels) while it's visible.

Given the availability of superior free and low-cost alternatives, it's hard to imagine circumstances in which this would be a worthwhile purchase.

Verdict

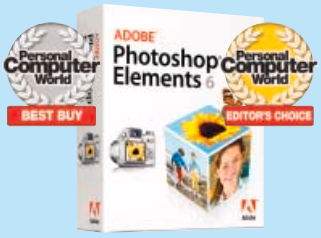
Pros Quick access to one-click tools; includes graphics package

Cons Poor design; clunky; inconsistent interface; ineffective tools

Overall Disappointing in every respect from the lack of adequate help to poorly designed and ineffective tools

Features	★★☆☆☆
Ease of use	★★☆☆☆
Value for money	★★☆☆☆
Overall	★★☆☆☆

Image editing software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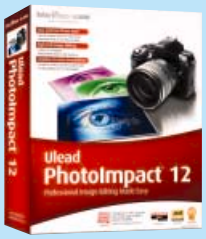
Straighten tool	✘	✔
Smart cloning (healing brush etc)	✘	✔
Smart selection/extract	✘	✔
Layers	✔	✔
Layer masks	✔	✘
16-bit support	✔	✔
Raw format support (check manufacturer website for specific camera Raw formats)	✔	✔
Plug-in support	✘	✔
Colour management	✔	✔
Web gallery	✘	✔
Photo merge	✘	✔
Panorama stitching	✘	✔
Print contact sheet	✘	✔
Print multiple images	✘	✔
Photo organiser	✘	✔
Interactive help	✔	✔
SYSTEM REQUIREMENTS		
Operating system	Windows 2000/XP/Vista	Windows XP/Vista, Mac OSX
Hardware	Pentium 4 or equivalent, 512MB Ram, 100MB disk space	1.3GHz processor, 256MB Ram, 1.5GB disk space
SCORES		
Features	★★★☆☆	★★★★★
Ease of use	★★★★★	★★★☆☆
Value for money	★★★★☆	★★★★☆
OVERALL	★★★★☆	★★★★☆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	✘	✔	✔	✔
	✔	✔	✔	✔
	✔	✔	✔	✘
	✔	✔	✘	✘ (Can open 16-bit files as 8-bit)
	✔	✔	✔	✘
	✔	✔	✔	✔
	✔	✔	✔	✘
	✔	✔	✔	✘
	✔	✔	✘	✘
	✘	✘	✘	✔
	✔	✔	✘	✔
	✔	✔	✘	✔
	✔	✔	✘	✔
	✔	✘	✔	
	Windows XP/Vista	Windows 2000/XP (Runs on Vista, though not specified)	Windows 2000/XP/Vista, Unix, Mac OSX	Windows 2000/XP/Vista
	1GHz processor, 512MB Ram, 500MB disk space	Pentium III or equivalent, 256MB Ram, 750MB disk space	200MHz processor, 128MB Ram	700MHz processor, 256MB Ram, 3GB disk space
	★★★★★	★★★☆☆	★★★★☆	★★☆☆☆
	★★★☆☆	★★★☆☆	★★☆☆☆	★★☆☆☆
	★★★★☆	★★★★☆	★★★★★	★★☆☆☆
	★★★★☆	★★★☆☆	★★★☆☆	★★☆☆☆

The urge to merge

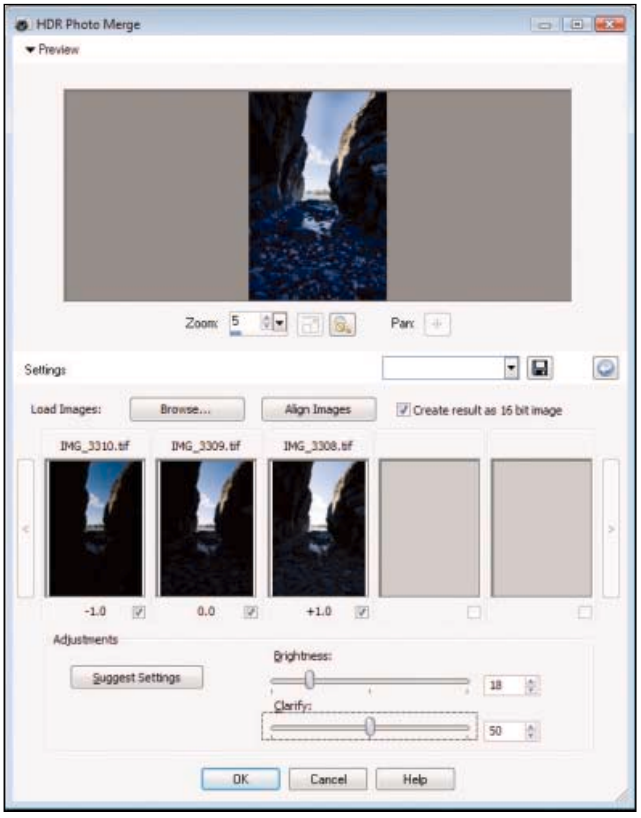
Photo editors are introducing automatic compositing tools that help you produce one really good photo from several not-so-good ones. These include high dynamic range (HDR) tools in Paint Shop Pro Photo X2 and Photoimpact 12 and the Photomerge feature in Adobe Photoshop Elements 6.

HDR combines images from several shots taken using different exposure settings. You might think it's best simply to take one photo with the correct exposure, but where the dynamic range of the subject is outside the range the sensor can record, something has to give. Either you expose for detail in the shadows and get 'blown' pure white highlights, or you expose for the brighter details and everything else looks black.

By shooting several bracketed photos using different exposure settings and combining them you can record all the detail. You can make an HDR image from only two photos, but for best results shoot from three to six. It's good to vary the shutter speed rather than the aperture to avoid changes in depth of field.

For the best-quality HDR images it's recommended you use a tripod. Another problem with compositing images is subject movement. Photoimpact provides tools that erase non-matching areas so if someone rides a bike through your third shot it needn't be a problem. But swaying trees, drifting clouds and flowing water are less easily dealt with and any kind of action rules out HDR.

Adobe Photoshop provides HDR tools, but these haven't been included in Elements. Instead, Elements uses similar compositing methods for features such as Photomerge Group Shot, which allows you to combine the best bits from several group photos.



Paint Shop Pro X2 lets you create a single high dynamic range photo from multiple shots

Editor's Choice

Editor's Choice Adobe Photoshop Elements 6
Recommended Corel Paint Shop Pro Photo X2

Adobe Photoshop Elements 6

Corel Paint Shop Pro Photo X2

Of the six applications in this software group test, two are clear front-runners: Adobe Photoshop Elements 6 and Corel Paint Shop Pro Photo X2. Both programs started out from a similar place and are travelling in the same direction.

Looking for a way to harness the power of Photoshop for non-professionals, Adobe came up with Photoshop Elements, which continues to provide all the best bits of Photoshop in an easy-to-use and understandable wrapper.

When Corel bought Paint Shop Pro from Jasc it was a powerful photo editor with a loyal following of users desirous of Photoshop performance without the high price.

Corel has since made the program easier to use, adding interactive guidance and a wealth of one-step fixes. It has done all of this while at the same time maintaining Paint Shop Pro Photo's appeal to advanced users and adding to an array of image manipulation and adjustment tools.

This latest release adds HDR photo merging, a Layer Styles tool and visible watermarking to the program's high-end feature list. Paint Shop Pro X2 therefore gets our Recommended award. We'd like to see Paint Shop Pro continue in this vein by rationalising and improving the effectiveness of its advanced editing tools. It would also reassure existing users if Corel could settle on its latest photo-management application, Media One, which is the third change in as many updates.

Though it wasn't first to market with its photo merge group shot feature, Adobe's Photoshop Elements has shown how it should be done with an easy-to-use tool that has really caught the current mood for pushing the boundaries of everyday photography. Most of us have appeared in group photos looking less than our best, so the ability to choose the good bits from a sequence of shots is something that everyone will appreciate.

We think Adobe should take a step back and put the organisation of the Elements workspace at the top of its priorities for future releases. We'd like to see better integration of the Organiser and Editor, fewer tabbed panels and improved guidance.

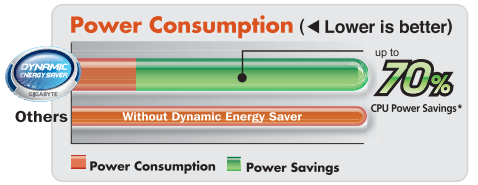
Despite these concerns, Photoshop Elements still provides the best all-round combination of ease of use, advanced editing controls and innovative new features, and for that reason gets our Editor's Choice award. **PCW**

One-Click Power Savings

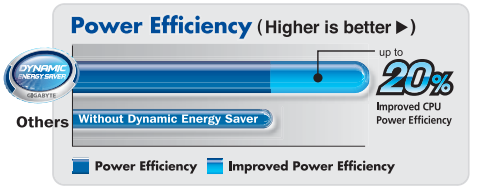
GIGABYTE Unveiles Revolutionary Dynamic Energy Saver Motherboards

GIGABYTE Dynamic Energy Saver Motherboards

This year, GIGABYTE is doing it again with the introduction of the GIGABYTE Dynamic Energy Saver. In addition to featuring the award-winning Durable 2 design, GIGABYTE adds an additional component to its technology arsenal, the Dynamic Energy Saver, providing Ultra Power Efficient performance with one simple click. Providing up to 70% power savings and 20% improved power efficiency, Dynamic Energy Saver motherboards are again setting the industry standard for Ultra Durable, Ultra Cool and Ultra Power Efficient performance.



* Up to 70% CPU power savings is measured with QX6850 during light loading when Intel C1E disabled



How Does GIGABYTE Dynamic Energy Saver Work?

The unique multi-gear power phase design of GIGABYTE's Dynamic Energy Saver allows for the most efficient switching of power phases depending on CPU workload. When the CPU workload is light or at idle, the Dynamic Energy Saver downshifts gears and only allows the minimum required power phases needed to accomplish the task to operate. By turning off the power phases that are not need, GIGABYTE's Dynamic Energy Saver is able to dramatically save power, up to 70% that would normally have been wasted. As soon as the workload increases, Dynamic Energy Saver recognizes that more power is needed and is able to shift into higher gear, turning on power phases as they are needed.

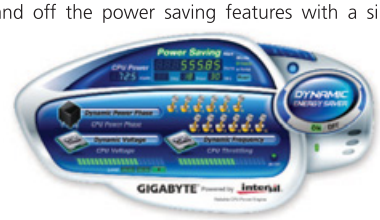
Unlike some power saving designs that only offer 2 gears, GIGABYTE's Dynamic Energy Saver features multiple gears, allowing the CPU to maintain optimum power efficiency from light all the way to heavy loading. In a 2 gear only design, each gear needs to operate longer at less than optimum efficiency, causing gaps in power efficiency. With the ability to switch on and off gears before they start to loose efficiency, GIGABYTE's Dynamic Energy Saver is able to provide up to 20% improved power efficiency.

Dynamic Multi-Gear power saving vs. Others

	GIGABYTE Dynamic Energy Saver	Others
Power Design	Dynamic Multi-Gear	1-Gear
Power Consumption	↓ Lower Lower is better	↑ Higher
Power Efficiency	↑ Higher Higher is better	↓ Lower
Gaps in Power Efficiency	X less gaps are better	Yes

User-friendly Dynamic Energy Saver interface

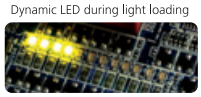
GIGABYTE's user-friendly Dynamic Energy Saver interface allows you to turn on and off the power saving features with a simple click of the Dynamic Energy Saver button. Not only can users see real-time CPU power consumption in Watts, but once Dynamic Energy Saver is enabled, users can also see how much power they are actually saving.



Dynamic LED Display

GIGABYTE Dynamic Energy Saver enabled motherboards feature an LED display located directly on the motherboard, allowing users to see the dynamic gear shifting in real-time. As each gear is activated, a color-coded LED representing the gear lights up.

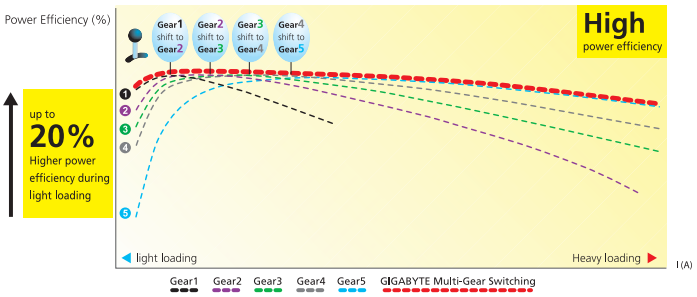
Dynamic LED during light loading



Dynamic LED during heavy loading

Dynamic Multi-Gear Power Design

Only multi-gear switching provides optimum power efficiency from light to heavy loading.



Benefits of GIGABYTE Dynamic Energy Saver

Dynamic Energy Saver | Cost Savings | Environmental Protection

GIGABYTE Dynamic Energy Saver + Intel® 45nm CPU = Unmatched Energy Efficiency

Quality Components Make Quality Motherboards

Ultra Durable | Ultra COOL | Ultra Power Efficient

GIGABYTE™ Powered by intersil.

Reliable CPU Power Engine

GIGABYTE's Full Range of Power Saving Solutions

Supports Intel Core 2 Quad | Supports Intel Core 2 Duo | Intel X48 Express Chipset | Intel X38 Express Chipset | Intel P35 Express Chipset

6-Quad

S-series

For more information about the GIGABYTE Dynamic Energy Saver motherboards please visit the GIGABYTE website at: http://www.gbt-tech.co.uk

The above photos are for reference only. Motherboard specifications may vary by model.

Please†visit :
http://forum.giga-byte.co.uk
http://partner.giga-byte.co.uk

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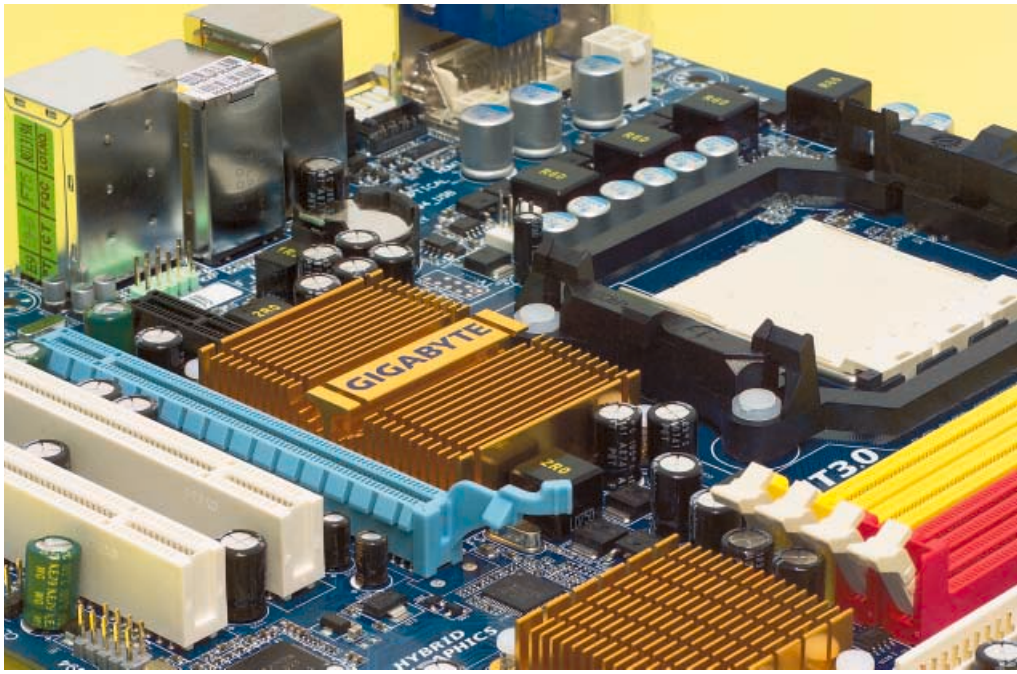
Miniature motherboards

The future looks bright for motherboards with integrated graphics. Emil Larsen explains



This month we've looked at six micro-ATX motherboards with integrated graphics. This form factor has an exciting future since Intel says its next integrated graphics chipset (G45) will be 1.7 times faster than the G35. Meanwhile, rival AMD is going to start squeezing graphics into the CPU on its Fusion design next year.

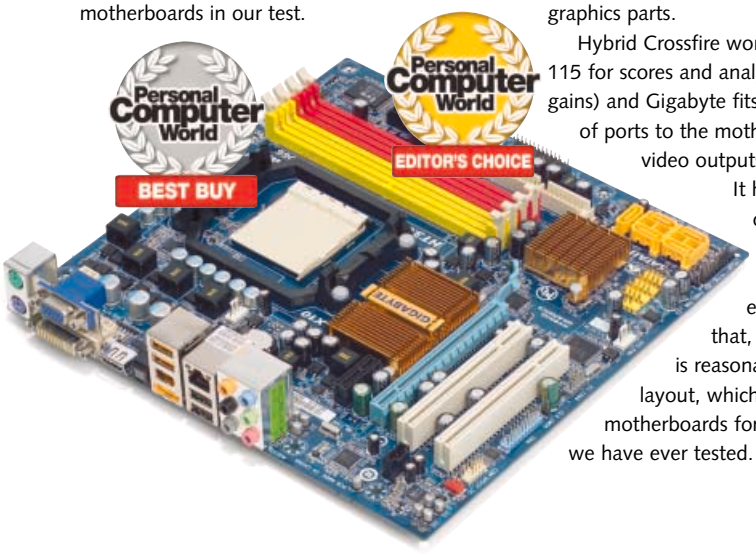
The biggest development this year, however, may turn out to be Hybrid Crossfire from AMD and Hybrid SLI from Nvidia – both of which promise big gains for low-budget PC gaming.

Historically, if you inserted a new graphics card into an existing PC, the integrated graphics will get turned off and simply go to waste. Hybrid systems combine the power of the new card and the existing integrated graphics, so you won't lose out on your initial motherboard investment if you add a new Hybrid-compatible graphics card at a later date.

Gigabyte GA-MA78GM-S2H

Hybrid technologies are exclusive to AMD processors at the moment, and Gigabyte's GA-MA78GM-S2H (pictured below) is the first with Hybrid Crossfire support.

At the motherboard's heart lies the 780G northbridge (this includes Radeon HD 3200 graphics and Hyper Transport 3 for the latest Phenom processors) and an SB700 southbridge that supports up to six Sata (serial ATA) ports, 14 USB ports, Raid and eSata. The southbridge's only flaw is relatively poor USB data-transfer performance, which was the worst of all the motherboards in our test.

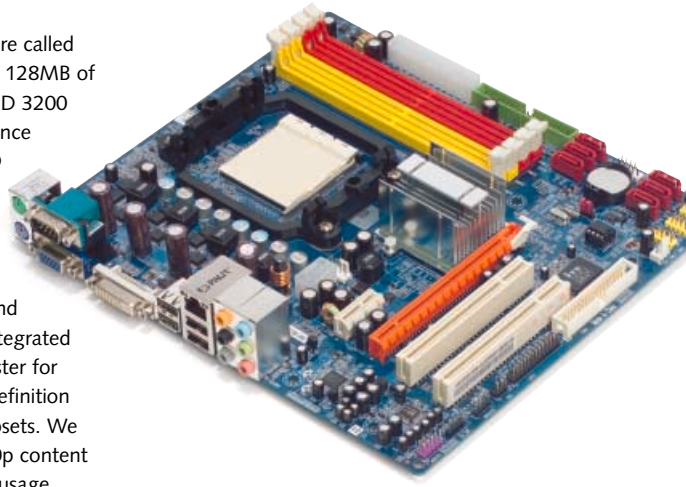


780G motherboards have a feature called Sideport memory that can add up to 128MB of dedicated memory for the Radeon HD 3200 graphics. This increases 3D performance by up to 15 per cent, but even AMD admits that the cost means few, if any, motherboard manufacturers will support it.

The Radeon HD 3200 is actually a rebranded Radeon HD 2400 Pro and is far more capable than any Intel-integrated graphics chip. This includes being faster for gaming and offering superior high-definition video decoding than most other chipsets. We played back a Blu-ray disc with 1080p content and registered just 30 per cent CPU usage throughout. It also copes well with Vista's 3D interface, unlike some of Intel's integrated graphics parts.

Hybrid Crossfire worked a treat (see page 115 for scores and analysis of the performance gains) and Gigabyte fits an outstanding array of ports to the motherboard, including three video outputs.

It has higher energy consumption than Intel platforms, but that is down to the Intel's efficient CPUs. Other than that, the GA-MA78GM-S2H is reasonably priced and has good layout, which makes it one of the best motherboards for home-theatre PCs that we have ever tested.



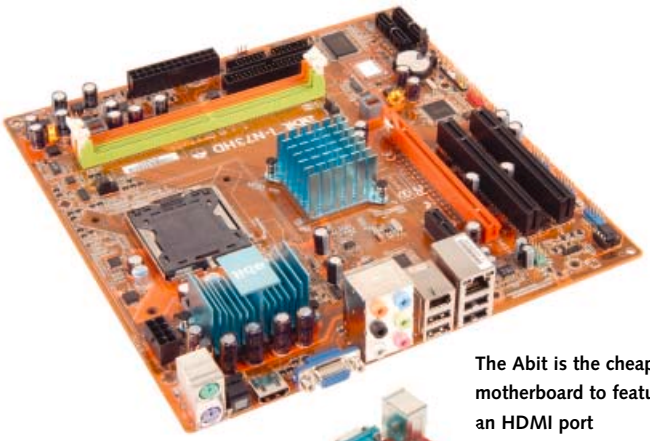
Palit N78S

Palit's foray into motherboards is a new one, but it does have considerable experience at making custom graphics cards.

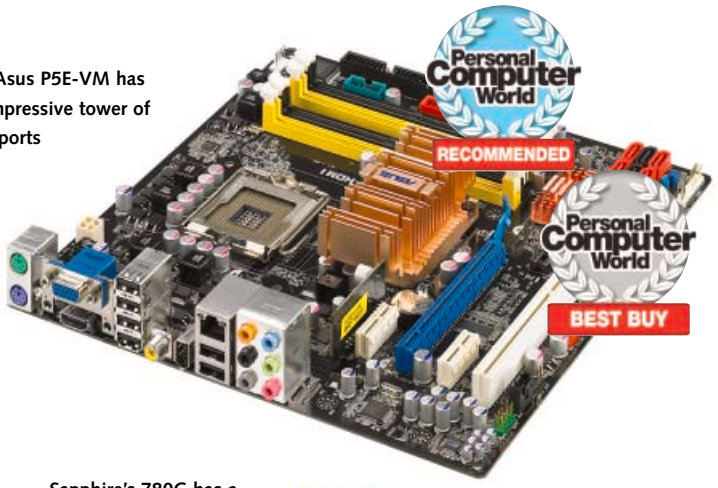
The N78S (pictured above) was sent to us as a preview-only board with no price tag. Its drivers and basic graphics performance are the finished article, but some of the board features could change before it goes on sale.

The N78S is based on the MCP 78 northbridge, of which there are three variants: U, S and D. The latter has no integrated graphics, while U and S have integrated graphics – the U version has slightly higher clock speeds than the S alternative.

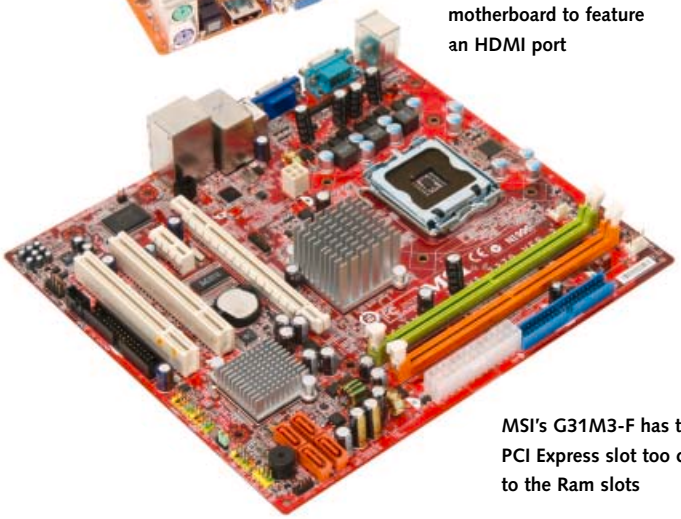
Palit's board is the S variant, with graphics called Geforce 8200. Like the Radeon HD 3200 graphics, these are DirectX 10 compatible. ↘



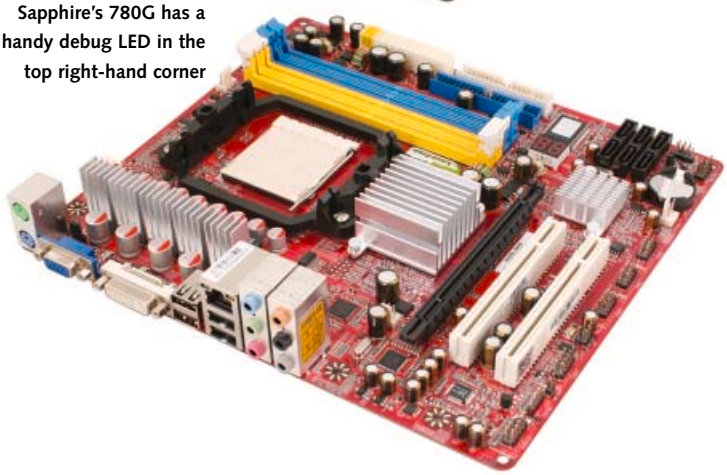
The Abit is the cheapest motherboard to feature an HDMI port



The Asus P5E-VM has an impressive tower of USB ports



MSI's G31M3-F has the PCI Express slot too close to the Ram slots



Sapphire's 780G has a handy debug LED in the top right-hand corner

Nvidia's MCP 78 has been delayed for some time, and it's probably no coincidence we had stability problems running PCmark05's CPU test and 3Dmark. It also occasionally failed to discover our hard disk when booting. Nvidia says it is working on Hybrid SLI for the MCP 78, but it doesn't work at the moment. Graphics performance was very reasonable for an integrated chip, scoring 18fps (frames per second) in Fear, which is just 3fps behind a £35 Geforce 8400 GS card.

Should Hybrid SLI be enabled for this chipset in the future, the performance of the Geforce 8200 and 8400 GS in parallel could be an exciting prospect.

USB performance, which is important if you use external hard drives and USB keys, was first rate, outclassing AMD's best. Support for 1,066MHz DDR2 memory is also included.

If the N78S goes on sale for around £60 it still has a long way to go before being a tempting contender to Gigabyte's 780G. There are fewer ports, Hybrid SLI is nowhere to be found and Nvidia's Vista drivers continue to cause headaches. The N78S could be the 780G's perfectly matched contender, but only if Vista stability improves, Hybrid SLI appears and the price is right.

Abit I-N73HD

Abit's motherboard, like other Nvidia-based boards, has the northbridge and southbridge in one package. This didn't have an effect on performance and should bring the cost down.

Its integrated graphics are fine for Vista's Aero interface but poor for gaming and, like MSI's G31M3-F, it won't accelerate high-definition decoding. There's also no HDMI-DVI dongle and just single-link DVI output, meaning resolutions above 1,920x1,080 aren't supported.

If you have a see-through side panel on your case then you'll appreciate its orange printed circuit board, green memory Dimms and blue heatsinks. It's much better than MSI's G31 motherboard for small home-theatre PCs thanks to its surround-sound output and HDMI port.

Asus P5E-VM HDMI

Like many P/G35 motherboards, the Asus P5E-VM has an impressive selection of frequency and voltage options. If you plan on changing the speed of the processor, Ram or PCI Express bus, then this is one of the best micro-ATX boards to do it. There is also fine control over fan speeds, to emphasise quietness or performance.

Like all Intel chipsets, though, the G35 gives poor control over Ram frequencies and timings. Graphics aren't as good as AMD's 780G, and the heatsinks can get hot, but there are benefits, such as its six USB ports and Firewire port.

The G35 chipset also speeds ahead of the competition due to a better memory controller. Overall, it's one of the best featured Intel motherboards around.

MSI G31M3-F

This is MSI's third attempt at a G31-based motherboard, but it starts with one huge flaw: the PCI Express slot sits too close to the memory slots so if you insert a discrete graphics card, it will rub against the Ram catches. It's a cheap business motherboard, since it has serial and parallel ports and a TPM (Trust Platform Module) chip that supports advanced business security options.

The downside of such a business-oriented motherboard is it only supports stereo audio, has poor onboard graphics and doesn't offer many tweaking options in the Bios.

Sapphire 780 GPI-AM2RS780G

Sapphire's 780G motherboard has the same core components as Gigabyte's version, but lacks HDMI, eSata, Firewire, a PCI Express x1 port and support for 1,066MHz Ram. It's also more expensive, which doesn't bode well.

However, its major saving grace is its excellent diagnostic display. Two LED counters cycle through a series of characters when the PC is turned on – if the system crashes, the two digits freeze to indicate which component is causing the problem, which can be very useful information. The motherboard's ports are also relatively well spaced out, with all six Sata ports in an easy-to-access arrangement.

But it's not enough to stop Sapphire's 780G looking average alongside Gigabyte's version.

Lab results

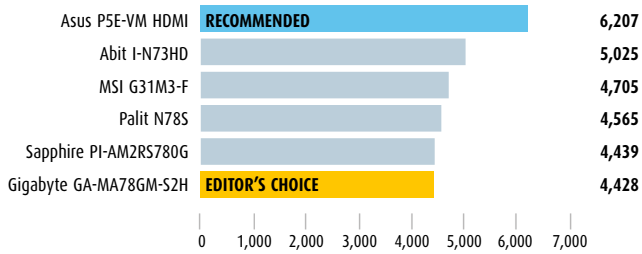
Power consumption and graphical capabilities will obviously be a factor if you are building a home-theatre PC that will switched on a lot of the time

To test the motherboards we chose an Intel Core 2 Quad Q6600 (2.4GHz) for Intel-based motherboards and a Phenom X4 9600 Black Box edition (2.3GHz) for AMD models. Both are quad cores and both cost £150 at the time of writing.

We used AMD's and Intel's retail CPU coolers. The rest of the test system consisted of 2GB Corsair Xms2 800MHz Cas5 DDR2 Ram, a Western Digital Raptor 150GB Sata hard disk, a Seasonic 600 watt (82 per cent efficient) PSU and Windows Vista 32bit.

PCmark05 (overall)

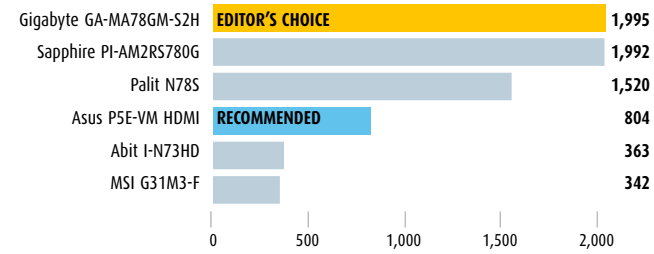
Bigger is better



Asus' board is more expensive so should really be considered in a different league from the other boards. Its G35 chipset makes mincemeat of the competition thanks mainly to its superior memory controller.

3Dmark06 (1,024x768 in 32-bit colour)

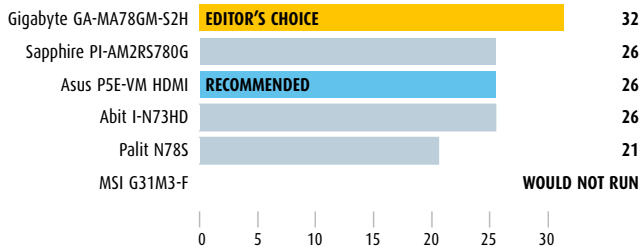
Bigger is better



The integrated Radeon HD 3200 rules the integrated roost. When we tested the boards with a Radeon HD 3450 256MB, the Gigabyte GA-MA78GM-S2H scored 1,125 points more than any other model. Hybrid Crossfire improved performance by 51 per cent compared with boards without the technology.

Fear (1,024x768, high settings)

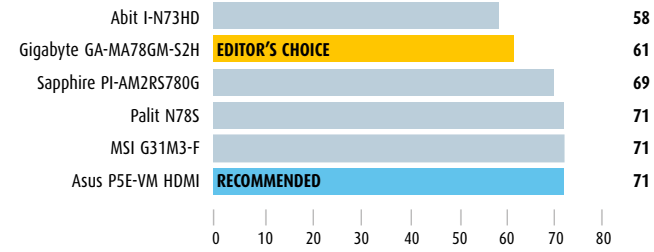
Bigger is better



We inserted a Geforce 8400 GS 256MB, which costs the same as the Radeon HD 3450, into the Palit N78S board to see if Hybrid SLI could be enabled. It couldn't, and performance is noticeably worse than AMD's products. Hybrid Crossfire wouldn't work on Sapphire's board, which Sapphire is investigating.

Idle power consumption (idle, in watts)

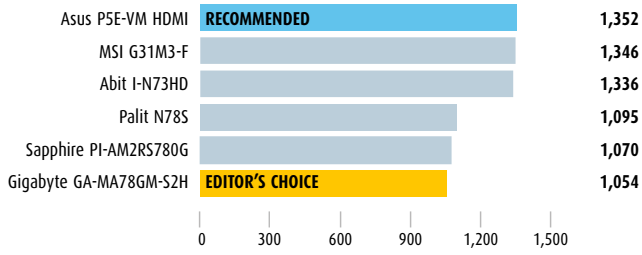
Smaller is better



AMD's 780G idle power consumption is vastly improved compared with the 790FX chipset. Although we enabled AMD's Cool 'n' Quiet technology on Sapphire's board, it still drew considerably more than Gigabyte's 780G, which suggests AMD's technology wasn't working properly.

Cinebench 2003 (multi-CPU)

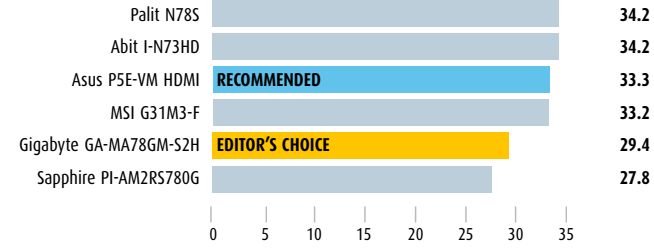
Bigger is better



There are small variances between motherboards, but the big difference is that Intel's quad-core CPU is far superior to AMD's in Cinebench. With the launch of new quad- and triple-core Phenom processors (see page 58 for our Phenom 9850 review), AMD's prices could drop to make them more competitive.

USB average read (in Mbytes/sec)

Bigger is better



For this test we attached an external, high-speed 10,000rpm Western Digital Raptor to a USB port and ran HD Tach 3. AMD's southbridge, which negotiates USB peripherals, doesn't compare well to Nvidia's alternative, which scored highest in our read, write and burst speed tests.

Micro ATX motherboards

MANUFACTURER	ABIT	ASUS	GIGABYTE	MSI	PALIT	SAPPHIRE
Model	I-N73HD	P5E-VM HDMI	GA-MA78GM-S2H	G31M3-F	N78S	780G PI-AM2RS780G
Price	£46	£81	£60	£41	Preview	£62
URL	www.abit.com.tw	http://uk.asus.com	www.giga-byte.co.uk	www.msicomputer.co.uk	www.palit.biz	www.sapphiretech.com/uk
HARDWARE						
Socket type	Intel socket 775	Intel socket 775	AMD socket AM2+	Intel socket 775	AMD socket AM2+	AMD socket AM2+
Chipset	MCP 73/Nforce 630i	G35/ICH9R	780G/SB700	G31/ICH7	MCP 78S	780G/SB700
Ram type	1,066MHz DDR2	1,066MHz DDR2	1,066MHz DDR2	800MHz DDR2	1,066MHz DDR2	800MHz DDR2
Memory slots	2	4	4	2	4	4
No of Sata/IDE/floppy connectors	4/1/1	6/1/1	5/1/1	4/1/1	6/1/2	6/1/1
No of PCI Express x16 2.0/x16/x1/PCI ports	0/1/1/2	0/1/2/1	1/0/1/2	0/1/1/2	1/0/1/2	1/0/0/2
No of serial/parallel/PS/2 ports	0/0/2	0/0/2	0/0/2	1/1/2	1/0/2	0/0/2
No of USB/Firewire/Ethernet ports	4/1/1	6/1/1	4/1/1	4/0/1	4/0/1	4/0/1
MULTIMEDIA						
Graphics processor	Geforce 7100	GMA X3500	Radeon HD 3200	GMA 3100	Geforce 8200	Radeon HD 3200
Video outputs	VGA, HDMI	VGA, HDMI	VGA, DVI, HDMI	VGA	VGA, DVI	VGA, DVI
Soundchip	Realtek ALC883	Realtek ALC883	Realtek ALC889A	Realtek ALC888	Realtek ALC883	Realtek ALC889A
Sound outputs	7.1 analogue, digital optical	7.1 analogue, digital coax	7.1 analogue, digital optical	2.0 analogue	7.1 analogue	7.1 analogue
OTHER INFORMATION						
Cables & other hardware	Sata data, HDD power, Pata data, floppy disk	3 Sata data, 3 HDD power, floppy disk, Pata data, plus HDMI to DVI dongle	Sata data, Pata data, floppy disk, plus eSata	Sata data, HDD power, Pata data, & TPM 1.2 chip	Sata data, Pata data	Sata data, Pata data, floppy disk
Dimensions (w(ports edge)xdxh)	244x244x41mm	244x244x38mm	244x244x36mmm	244x218x39mm	243x219x37mm	244x219x39mm
Full-version software included	None	Corel Snapfire Plus SE	None	None	None	None
Standard warranty (RTB = return to base)	2yrs RTB	3yrs RTB	3yrs RTB	2yrs RTB	Not specified (preview board)	2yrs RTB
SCORES						
Features	★★★☆☆	★★★★☆	★★★★★	★★☆☆☆	N/A	★★★☆☆
Performance	★★☆☆☆	★★★★☆	★★★★★	★★★☆☆	N/A	★★★★★
Value for money	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆	N/A	★★★☆☆
OVERALL	★★★☆☆	★★★★☆	★★★★★	★★★☆☆	N/A	★★★☆☆

Editor's Choice

Editor's Choice Gigabyte GA-MA78GM-S2H
Recommended Asus P5E-VM HDMI

Gigabyte GA-MA78GM-S2H

Asus P5E-VM HDMI

There have been a lot of superlatives used to describe AMD's new 780G chipset, but that doesn't mean those motherboards using it are gaming heaven. Modern titles will be at low settings and games almost three years old, such as Fear, will still struggle to play at 1,024x768 resolutions with high settings.

That said, the 780G does show a noticeable increase in performance over previous integrated graphics chipsets' 3D prowess, and is truly effective at playing back high-definition movies.

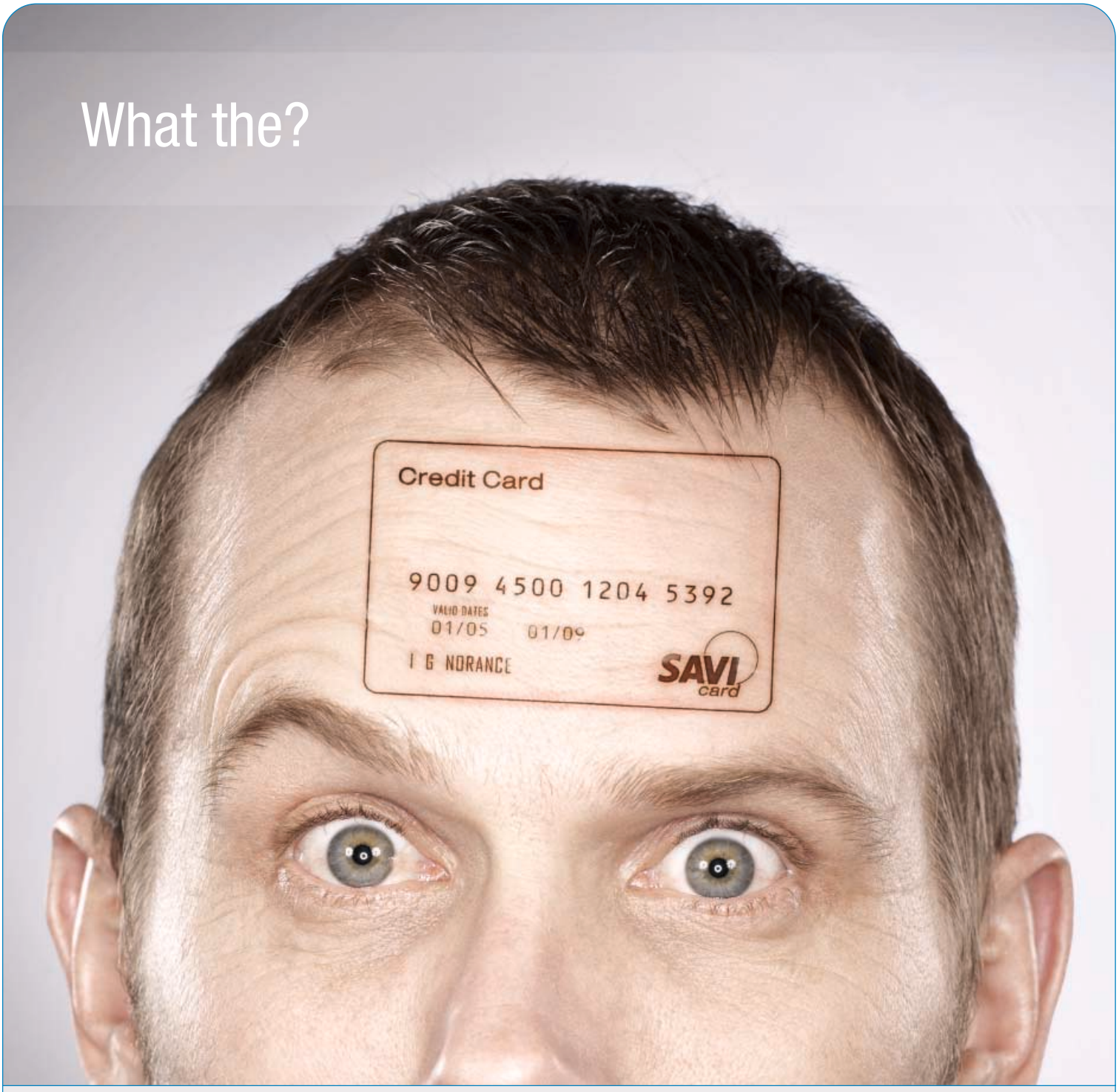
The heat generated by such a heavily featured northbridge with integrated graphics is also noticeable. Every motherboard tested here was hot to touch and won't overclock well until the integrated graphics is disabled.

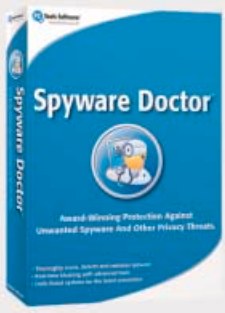
Neither Intel nor AMD expect integrated graphics to become high-end gaming choices any time soon. Cost is the biggest issue, but heat and design challenges are other factors. Intel says its forthcoming graphics card (Larrabee) will be a PCI Express model, while AMD's Fusion chips, which will combine CPU and graphics processors in one package, will be aimed at cheaper systems. Despite this, the 780G is still a triumph simply because it makes the best of a bad situation. AMD's Phenoms are slower, hotter and more expensive than Intel's quad-core chips, but look at the CPU and motherboard combined and AMD has a good-value package.

Even if you don't need high-end graphics, Gigabyte's GA-MA78GM-S2H is our Editor's Choice due to its many ports and Bios options (pressing Control & F1 opens up even more options on Gigabyte motherboards.

If you want an Intel platform, Asus' P5E-VM HDMI is our Recommended choice. You pay more than you do for the Gigabyte board, but it has a great range of features and the G35 chipset is ideal for even the fastest Intel quad cores. **PCW**

What the?





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BUSINESS

EXCHANGE AND SMART

An email server is a must-have for many small businesses and Microsoft Exchange is a popular choice. However, it's not the only option and several alternatives offer much the same functionality, and are both cheaper and a lot easier to manage. We put three of these products, designed specifically for use in growing businesses, through their paces.

We also have an eclectic mix of standalone reviews, including Sage's revamped Instant Accounts package and a small yet fast addition to the HP Laserjet family.

We also examine the impact an eSata interface can have on the performance offered by a Hypertec Firestorm external disk drive. Plus, we check out Powerwise, a neat energy-saving management tool, and see how the latest Nuance PDF Converter package compares against rival Adobe Acrobat.

CONTENTS

GROUP TEST

120 Three mail servers aimed squarely at small businesses are put to the test

REVIEWS

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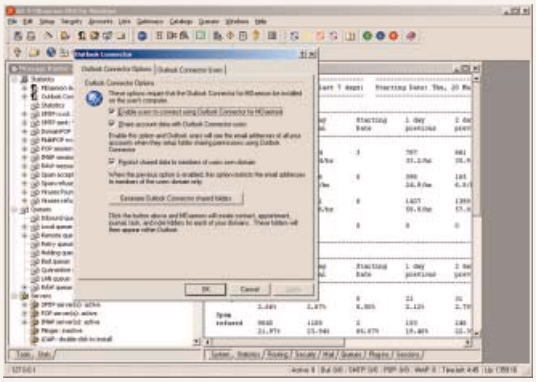
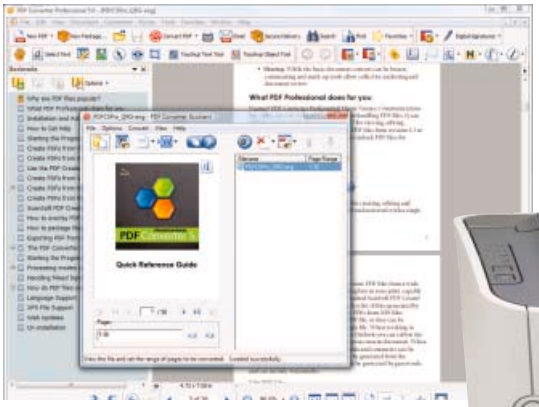




OUR SCORING

Excellent ★★★★★ **Very good** ★★★★☆ **Good** ★★★☆☆ **Below average** ★★☆☆☆ **Poor** ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.
Recommended: A product that combines great features, usability and value for money.
Great Value: Not the best in class, but a product that has superior features and performance for the price.

Editor's Choice Business

Recommended Business

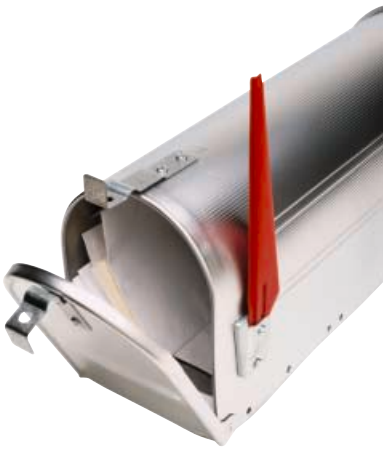
Great Value Business

The business awards are used for products that are more suited to home offices or small businesses.

'Compact, cute and quick, the Laserjet P1505n is a capable small-business laser printer'

Read the review on page 125

Smart exchange



There are alternatives to Microsoft's Exchange mail server. Alan Stevens tests three options aimed at small businesses

Microsoft Exchange is one of the most popular mail servers around, but it's neither cheap nor easy to manage, especially for small companies lacking IT expertise. But there are alternatives. In this group test we look at three mail server products designed with the small business in mind.

All three offer core messaging facilities with support for a range of standard clients including Microsoft Outlook and browser-based web mail. Anti-virus and spam filtering are available, along with support for public folders, calendar sharing and other Exchange-like features.

Compared to Exchange they're a lot more affordable and they don't necessarily need specific hardware; indeed on a small network you might be able to get away with a desktop PC. They're quick to install and require little day-to-day management, using either web or Windows-based management consoles.

FTGate5 Professional Edition

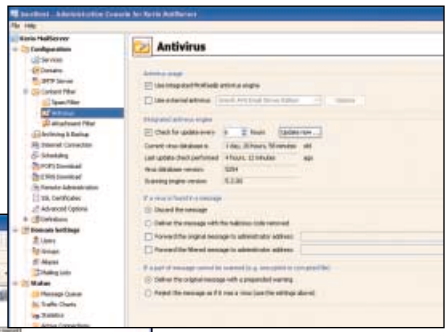
FTGate5 is a UK-developed SMTP mail server with support for both Pop3 and Imap4 message retrieval using Outlook and other compatible clients. Groupware functionality comes built in and is available both via the Solsight web client bundled with the package and to Outlook users when the optional Outlook connector is configured. Anti-spam and anti-virus scanning are standard features.

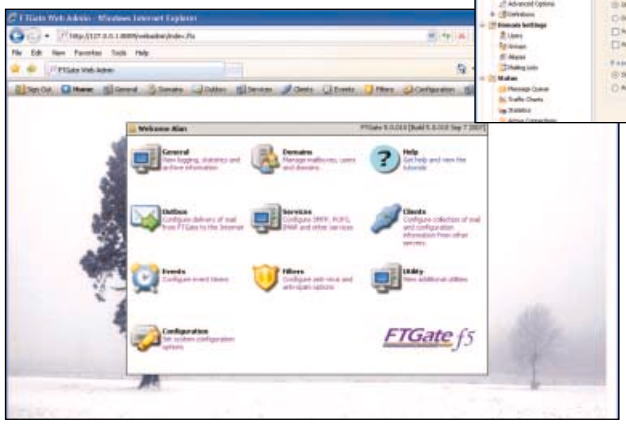
We downloaded the software (38MB) from the FTGate website and installed it on a Windows XP PC, although a server implementation is recommended to support more than a few users. Multiple domains can be handled by the software, with a wizard to take you through creation of the first one. You're also prompted to create the first user at this point. Bulk import facilities are also available, from a file or via Active Directory.

Initial setup takes a few minutes, after which the background services supporting the mail server are started automatically. Everything else is then done via the browser, with a clear interface making it simple to perform tasks. Users can also manage some of their own settings via a browser interface.

An anti-virus scanner is not included but can be added using third-party products, such as the Sophos Anti-Virus already installed on our test system. You also get a number of anti-spam tools, including the ability to block attachments and scan messages. The server can also filter messages using FTGate's own Ubeblock self-learning technology. We didn't find this easy to configure, but the documentation was a help and there's also an active online support forum.

In terms of collaboration features the FTGate5 server is able to share folders, address books, calendars, and task lists. These facilities require the Outlook Connector to be installed which, according to FTGate, works best with Outlook 2007, although earlier versions should also be OK. The groupware options are also available via the Solsight web client. It's not quite a match for Outlook Web Access, but is easy to use. There are no archiving or mobile synchronisation facilities, but basic logging and activity monitoring tools are a standard feature and, for the most part, only minimal management should be needed to keep this product running at its best.





Above: Kerio Mail Server can be configured to use third-party anti-virus software and/or an optional built-in McAfee scanner

Left: Not too sure about the trees in the background, but the web-based interface does make FTGate5 easy to manage

Kerio Mail Server 6.5

Unlike the others in this group test, the Kerio Mail Server is available for Apple Mac and Linux platforms as well as Windows. All support a comprehensive set of collaboration options with built-in backup and archiving tools plus support for push email and wireless synchronisation to PDAs.

On a network a server is recommended, although for our tests we installed the software on a Windows XP PC. A quick-start wizard helps configure the primary domain with the mail server run as a background service, while administration is via a custom Windows console that can be run remotely.

We found the interface straightforward and it was easy to perform common tasks. By default users are authenticated against an integrated database with Active Directory integration an option and Open Directory support on Apple networks.

We liked the built-in backup service, which can be set to take scheduled backups. Remote and local archiving is another useful option for companies looking for regulatory compliance.

The security options are impressive and a version of the software is available with a built-in McAfee anti-virus scanner (£299 ex Vat for 10 users). Even without, there's support for a range of third-party products and lots of anti-spam options.

Two web-based interfaces are available – a full client for desktop use and a cut-down version for use on handheld devices. The full client has a familiar, Outlook-like, feel and offers support for shared folders and other features via the Kerio Outlook Connector.

With this installed we were able to access public address books, shared calendars and other folders held on the server. Users can also schedule meetings, just as with Exchange, as well as customise spam protection via the connector.

Similar groupware options are available to Apple Mac users running Entourage and a

built-in list server is yet another option in Kerio Mail Server, along with comprehensive logging and reporting facilities.

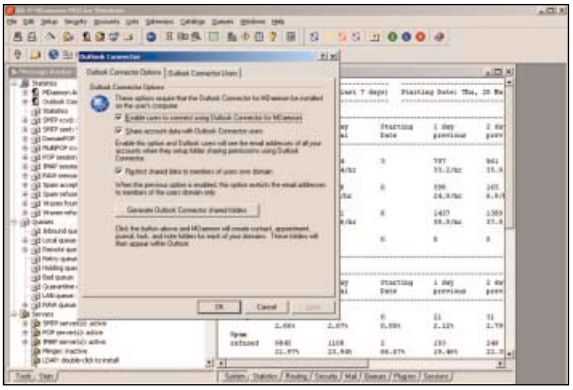
The supporting documentation is good, there's an online knowledge base, plus email and phone support.

MDaemon Pro 9.6

An Exchange alternative, MDaemon Pro is a robust multi-domain SMTP mail server that can be used with any Pop3 or Imap4 client. A browser-based client (Worldclient) is included, along with content filtering and basic anti-spam tools, while anti-virus protection and other security features are available via an optional plug-in. Exchange-like collaboration is, similarly, available to Outlook users via a plug-in.

We installed MDaemon Pro on a Windows XP desktop, although on a large network it's best with a server. Installation is quick, with a wizard that prompts for the domain and administrator account details, after which the server can be started manually or run as a background service. A Windows console is provided for remote administration, along with browser-based management.

The management console can take a while to get to grips with. However, switch to 'Easy mode' and all but the most important options are hidden. User accounts are easy to manage with bulk import and Active Directory integration if required. The security features are similarly straightforward to configure, with anti-relay controls turned on by default along with a number of built-in anti-spam tools, including heuristic and Bayesian self-learning engines.



Add the optional Outlook Connector plug-in and the MDaemon server can match Exchange for groupware collaboration features

Anti-virus scanning is only available if you buy the Securityplus plug-in but, starting at £64.10 ex Vat per year for six users, it's not expensive. To take full advantage of the MDaemon groupware options you'll need the Outlook Connector plug-in, starting at £61.54 ex Vat for six users. The connector adds support for Exchange-like options such as calendar sharing, plus out-of-office responders and offline working. Worldclient users get similar facilities with an enhanced Outlook-like interface and a cut-down interface for mobile users both available.

SyncML synchronisation with mobile devices is another built-in option, and you also get a list server plus extensive logging and reporting tool. Online and telephone support is available to licensed users and there's a knowledge base with lots of useful how-to articles. Very little day-to-day supervision is required and, as far as users are concerned, it's very similar to Exchange.

Editor's Choice

At first glance there's very little to choose between the three SMTP mail servers here. All offer support for both Pop3 retrieval and Imap4 – where messages are held on the server itself – so can all be used with Outlook, Outlook Express and other common email clients, with a browser-based client, similarly, available in each case. All also offer anti-virus, anti-spam and other email security options, with groupware collaboration another common feature. They also all have similar hardware requirements, cost about the same and, compared to Exchange, are easy to install and manage.

That said, we did find a number of differences, with the Kerio Mail Server, for example, the easiest of the bunch to work with and a good choice if that's your main concern. However, for its comprehensive collaboration options and extensive security features our Editor's Choice award has to go to MDaemon Pro. It's not the easiest to manage, and you need to buy extra plug-ins to get all the features but it's all worth it if it's a true Exchange alternative you're after. **PCW**

Mail servers

SUPPLIER	FTGATE TECHNOLOGY	KERIO TECHNOLOGY	ZEN SOFTWARE
Product	FTGate5 Professional Edition	Kerio Mail Server 6.5	MDaemon Pro 9.6
Web	www.ftgate.com	www.kerio.co.uk	www.zensoftware.co.uk
Contact	01366 500 560	01223 370 136	0161 660 5738
Price	£276.13 (£235 ex Vat)	£293.75 (£250 ex Vat)	£228.97 (£194.87 ex Vat)
No of users for price quoted	10	10	6
Server platforms	Windows	Windows, Mac, Linux	Windows
Imap4/Pop3/Outlook Connector	✔/✔/✔	✔/✔/✔	✔/✔/Optional
Web email	✔	✔	✔
Shared folders/address books	✔/✔	✔/✔	✔/Optional
Shared calendars/task lists	✔/✔	✔/✔	Optional/Optional
Anti-spam/Anti-virus	✔/Third-party scanner required	✔/✔	✔/Optional
List server/Archiving/Mobile sync	✔/Limited/✘	✔/✔/✔	✔/Optional/✔
Pros	Groupware functionality included as standard; anti-virus and anti-spam options	Multi-platform support; comprehensive groupware options; integrated anti-virus and anti-spam; mobile synchronisation	Comprehensive collaboration features; lots of security options; integrated list server
Cons	Third-party anti-virus scanner required	Windows management console only	Management console complex in places; security and Outlook Connector plug-ins extra
SCORES			
Features	★★☆☆☆	★★★☆☆	★★★★☆
Ease of use	★★★☆☆	★★★★☆	★★★☆☆
Value for money	★★★☆☆	★★★☆☆	★★★★☆
OVERALL	★★★☆☆	★★★☆☆	★★★★☆
Summary	Not as comprehensive as some, nonetheless FTGate5 ticks most of the boxes and is an easy-to-use and affordable mail server	Don't let the low price fool you – Kerio Mail Server offers almost everything you can get with Exchange	Affordable and easy to manage, MDaemon Pro offers the functionality of Exchange and then some

ACCOUNTS SOFTWARE

Sage Instant Accounts

Easy-to-use small-business bookkeeping package

A new practice mode lets you experiment without affecting your live company data

There are no radical enhancements in the latest version of Sage Instant Accounts, just considered improvements focused around making the package easier to learn and use. Those include a new welcome page giving access to sources of help and support, and a practice mode that lets you experiment without affecting your own live data. Some of the interfaces have also been tidied and tools moved around. All of which is good, although we did still find it a little difficult in places.

The Sage Line software, on which Instant Accounts is based, is popular with accountants and other professionals, but can be baffling for those unfamiliar with things such as control codes and ledger postings. Fortunately, jargon is kept to a minimum in the Instant version although, behind the scenes, you still get a full set of sales, purchase and nominal ledgers. Together these let you generate invoices for products and services, raise purchase orders, keep track of your cashflow, reconcile your bank account and so on – all the things small companies need to run smoothly.

Vat accounting is also provided for, with everything to do with Vat now collected into one area. As you might expect, small-business schemes are well catered for here plus there's now full support for online reporting to HMRC.

Stock control isn't included, but there is a Plus version with this as an option (£169.36 ex Vat). Similarly, it's possible to pay employees by adding Instant Payroll (£95 ex Vat) and to accept payments by credit/debit card by subscribing to Sage card payment services, support for which is now built into the Instant Accounts application.

Installation is straightforward, with an improved wizard to guide you through the process of entering information. You can also import existing customer and product details, although only in CSV format.

Alternatively, you can choose to work on your own practice data, either starting afresh or returning to the point at which you left off. There's no substitute for learning from your own mistakes and it's reassuring to know you're not working on live data.

There's nothing fancy about the user interface, which is good and, for the most part, we found it very easy to follow with clearly defined task options plus links to lots of supporting help and advice. Most of these links are gathered together on the always-available welcome page, giving access to instructional videos and online e-learning workshops together with PDF guides and suggestions for both getting started and performing common tasks.

On the downside, the user-friendly 'let's help the novice' approach isn't followed across all the tools, and some jargon does creep in. We found the revamped report designer particularly heavy going, which could be an issue as it's used to customise invoices and other forms as well as design reports. Likewise, we would have preferred to see error correction integrated throughout the application rather than implemented via a separate dedicated module.

The package comes with telephone support for the first 45 days as well as online support and optional health and safety advice for a year. Automatic updates and a Sage newsfeed are among other additions and, despite a few remaining rough edges, Instant Accounts now has just about everything a small company needs to keep on top of its finances. *Alan Stevens*

Verdict

Pros Practice mode; welcome screen with links to sources of help and support; enhanced Vat management; health and safety advice

Cons Stock control and payroll extra; complex forms designer

Overall A good small-business accounts package, the enhancements to the latest version of Sage Instant Accounts make it even easier to learn and use

Features	★★★☆☆
Ease of use	★★★☆☆
Value for money	★★★★☆
Overall	★★★☆☆

Price £135.13 (£115 ex Vat)

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System requirements 1GHz processor (2GHz or above recommended) • 512MB Ram (1GB recommended) • 400MB free disk space • Windows 2000 or later

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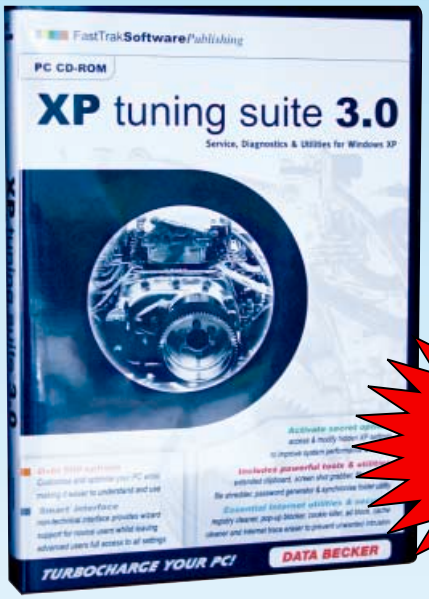

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(CODE PC09)

MONO LASER PRINTER

HP Laserjet P1505n

This little laser is faster than it looks

Don't let the lack of size fool you, the P1505n can print at up to 23ppm

Not long ago, a network laser capable of churning out documents at 20-plus pages per minute (ppm) would be the size of a small fridge and cost hundreds of pounds. But times have changed, and the latest member of the HP Laserjet family, the P1505n, is little bigger than the average desktop inkjet. In spite of that, it's got a built-in network interface, can print at up to 23ppm, and sells for just £175 ex Vat.

OK, it's not a colour printer but then the majority of office documents are printed in black and white anyway. And it's not exactly a heavy duty solution, although with a duty cycle of up to 8,000 pages per month it's more than adequate for sharing on a small company network.

Setup is about as easy as HP can make it. Take the printer out of its box, remove the various bits of orange tape and attached packing pieces, plug it in and turn it on. There's no LCD panel to concern yourself with, just a couple of buttons to clear jams, and a single toner cartridge is the only consumable, with a 1,000-page starter supplied ready fitted. Replacements should last double that (up to 2,000 pages) and are available from HP for £44 ex Vat, or for less from other suppliers.

Of course you also have to install the driver, using the CD supplied. But that's easy too, with a video also available during the install for those who have problems with the printed getting started leaflet. You can also install a print monitor utility and, somewhat craftily, software to shop for supplies from HP online.

A single plastic drawer is used to feed in the paper, this slotting in at the front and holding up to 260 A4 sheets, while finished documents are ejected into a well on the top. Between them is a so-called priority slot, able to take 10 sheets for when you need to print envelopes, labels and other non-standard media. We tried a variety of these and had no problems at all.

On the downside, the lack of a duplexer is a bit of a disappointment, but it would add to the bulk and, at this price, few are likely to complain. Manual duplexing (take the printed pages out, turn them over and put them back in) is an option in the driver.

A USB2 port allows for direct PC connection (supply your own cable) with a UTP Ethernet socket alongside. This isn't a full-blown Jetdirect interface, but it does the job, enabling clients to print over the Lan, with a built-in web server for remote management.

On the electronics front you get a 266MHz processor and a fixed 32MB of memory, with PCL5e emulation the order of the day. Again, not the greatest in terms of specification, but good enough for most small-business users and fully able to support printing at up to 23ppm, with an impressive first page out time of less than 6.5 seconds.

We printed a variety of documents and were more than happy with the results. Text was crisp and black with good reproduction of greyscale images. Photos were a little grainy, but you can't expect perfection on a printer in this price bracket and it is very much a business laser. If it's photographs you want, or colour, buy something else. *Alan Stevens*

Verdict

Pros Tiny footprint; 23ppm mono laser; integrated network interface

Cons No duplexer; limited paper handling

Overall Compact, cute and quick, the Laserjet P1505n is a capable small-business laser and amazingly good value to boot

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £205.63 (£175 ex Vat)

Contact HP 0870 241 3625 www.hp.com

Specifications Up to 23 pages per minute mono laser • 600x600dpi • 8,000 pages/month duty cycle • 266MHz processor • 32MB Ram (non-upgradeable) • PCL5e emulation • USB2 and integrated 10/100Mbits/sec Ethernet interfaces • 260 sheet A4 feeder; 10-sheet manual feed slot • 1,000-page cartridge supplied with printer

EXTERNAL STORAGE

Hypertec Firestorm

Go faster with this eSata-enabled external disk drive

By connecting to a Hypertec Firestorm disk using eSata we got double the transfer rate possible with USB

External disks are great, in that they let you add extra storage to a PC or server with minimal fuss and expense. Unfortunately, most use USB to connect to the host system, which limits the speed at which data can be transferred and hence the type of application for which they can be used. The latest Hypertec Firestorm drives, however, have eSata as well as USB interfaces, which makes them far more flexible.

As the name implies, eSata is an extension to the serial ATA (Sata) interface, used for internal storage on most modern desktop PCs and small-business servers. The 'e' stands for external, an eSata interface enabling external disks to deliver the same level of performance as those inside a host system. You can even boot from an external disk connected via eSata, if you want.

Hypertec Firestorm drives are available in a variety of capacities, starting with the 80GB model we tested, up to a 500GB version (£120 ex Vat). A dual-drive implementation is also available with a total capacity of either 1.5TB (£441 ex Vat) or 2TB (£671 ex Vat), with optional Raid protection if needed.

All come housed in sleek alloy cases designed to dissipate heat without the need for a cooling fan, an approach that also makes them very quiet. A small stand allows the drive to be positioned where needed, while power is supplied via a separate AC adapter that plugs in at the back next to the USB and eSata connectors. Leads for both are provided and, as few PCs or servers have eSata interfaces as yet, you also get an adapter for use with internal Sata ports. This fits into a standard expansion bay, although there's no card to plug in, just a backplate and a cable to attach to an internal Sata port.

On the inside each Firestorm drive comprises little more than a hard disk and a small interface module. Our 80GB product, for example, had a single 7,200rpm Sata disk from Excelstor, a Chinese manufacturer recently acquired by Iomega, with similar drives in the other models.

Performance will depend on a number of factors, including the specification of both the disk inside the Firestorm and the PC or server to which it's attached. To give you an idea of what to expect we attached the drive to a modest Intel Xeon-powered server running Windows Server 2008, first using USB then eSata. In each case we formatted an NTFS volume on the external disk, then ran a number of file copy tests from an internal Sata volume.

With the drive connected via USB we achieved an average transfer rate of just over 21Mbits/sec, whereas when using eSata the transfer rate more than doubled to 48Mbits/sec, illustrating just what an effect the choice of interface can have. To put that into perspective, a backup of a 160GB drive on this server might take just over two hours if copying to the Firestorm via USB, but only 56 minutes if connected using eSata.

Bear in mind that similar drives with eSata interfaces are available from other vendors. However, the Hypertec product also ships with a copy of Syncback, a freeware backup program, and Truecrypt, which can be used to encrypt data held on the disk. All of that adds up to a very usable and attractive small-business storage solution.

Alan Stevens

Verdict

Pros eSata and USB interfaces; choice of capacities; bundled backup and encryption software

Cons Lots of alternatives to choose from

Overall With its eSata interface this external disk can match internal drives in terms of performance

Features	★★★☆☆
Ease of use	★★★☆☆
Value for money	★★★★☆
Overall	★★★☆☆

Price £72.85 (£62 ex Vat) – 80GB Firestorm

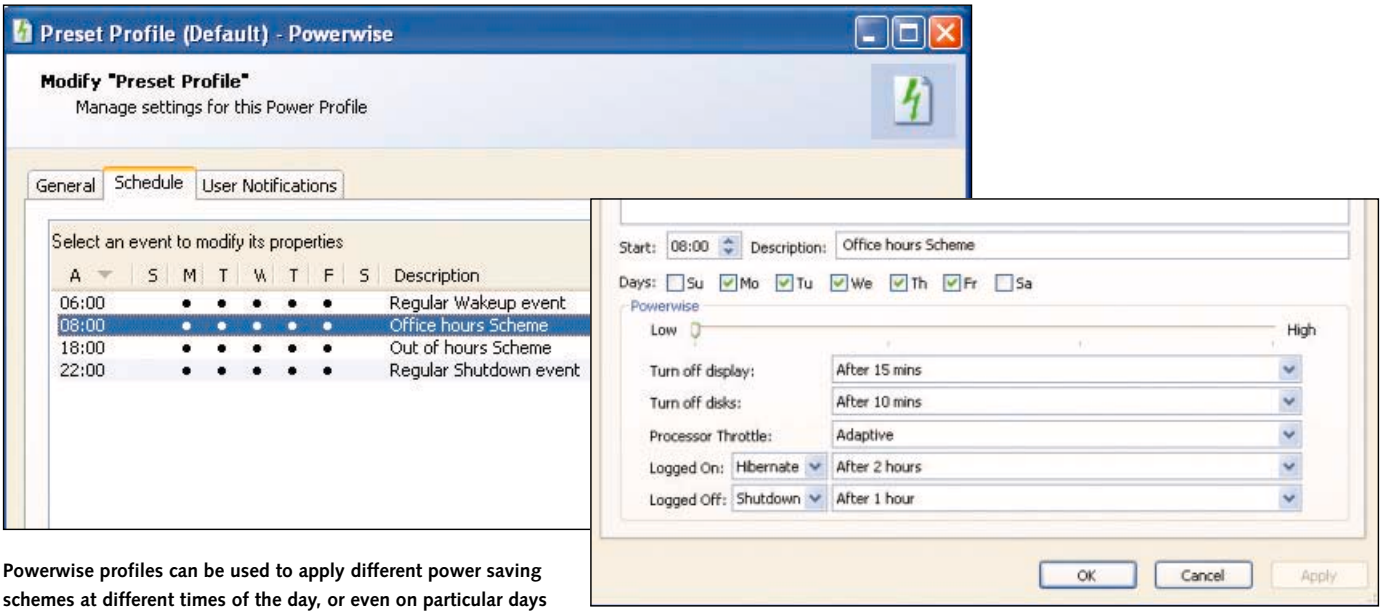
Contact Hypertec 0870 243 5603

Specifications Excelstor Jupiter 7,200rpm Sata hard disk • USB2 and eSata interfaces • Bundled USB cable, eSata cable and Sata to eSata adapter • Syncback SE backup software • Truecrypt encryption utility

POWER MANAGEMENT

Modus Interactive Powerwise

Go green with this energy-saving software



Powerwise profiles can be used to apply different power saving schemes at different times of the day, or even on particular days

Soaring electricity prices have prompted more and more companies to look for ways of managing the amount of energy they consume. A number of utilities are now available which centrally control how much energy PCs use. One such utility is Night Watchman, which we reviewed in the March issue (see **www.pcw.co.uk/2207429**), and another is Powerwise from Modus Interactive.

Unlike the command-line scripted Night Watchman software, Powerwise is managed via a familiar Windows GUI and comes in three parts, starting with a central server installed and run as a background service.

Despite the name, the Powerwise server can be hosted on any machine running Windows 2000 or later. For our tests we installed and used it on a virtual machine running Windows XP. However, because it relies on TCP/IP connections, a Windows server would be a better choice on large networks.

The server install takes a couple of minutes, with a separate Windows console used to manage the product, while the third component is an agent that needs to be installed onto every PC you want to manage. The agent can be installed on both desktops and servers, and pushed out and remotely installed using a console wizard. Alternatively, the software can be pulled down and installed using a browser, and support for group policy deployment and the use of third-party distribution tools are also included.

Active Directory integration comes as standard but isn't a prerequisite, and the software can also be used on small Windows workgroup networks. It doesn't take long to get to grips with the way Powerwise works, mainly because it's simple to use.

Network clients can be manually added via the console or automatically discovered and grouped together for ease of management. The Powerwise console then makes it easy for administrators to remotely manage any of the Windows power settings more usually set via the local control panel.

From the console, for example, we were able to view the power status of individual client PCs, turn off monitors, reboot or power them down remotely. Those with support for Wake-on-Lan (WoL) could also be powered up, for example, to allow updates to be applied out of hours. We were also able to apply power management tasks to groups of PCs and remotely.

All of that is fine, but most administrators will want to automate procedures, for which it's possible to both apply and design custom power profiles. Profiles, in turn, let you schedule different settings and events to be applied to individual PCs or groups of computers according to time of day and day of the week.

For example, we were able to enforce a shutdown every night and automatically power up test PCs on weekday mornings using a custom Powerwise profile. In between, we ensured maximum performance by applying only minimal savings during core working hours, with more aggressive settings at other times. Users can also be stopped from altering power settings and warnings displayed when a remote shutdown or other scheduled operation is about to begin.

Powerwise has little impact on the host network with very little traffic generated between clients and the central server, making for a very scalable solution. Basic report facilities are also provided and, once set up, the amount of management required is minimal. For the most part you can simply forget about it, sit back and enjoy the savings. *Alan Stevens*

Verdict

Pros Works with desktops and servers; graphical management console; profiles for automation

Cons Windows only

Overall Easy to use, this tool really could help cut power bills

Features	★★★☆☆
Ease of use	★★★★★
Value for money	★★★★☆
Overall	★★★★☆

Price £11.75 (£10 ex Vat) per seat (discounts for more than 500 seats)

Contact Modus Interactive
020 8819 8040
www.modus-interactive.co.uk

System requirements

Server: Windows 2000/XP/Vista or Windows 2000/2003 Server • 10MB Ram • 70MB free disk space

Client: Windows 2000 or later (desktop or server) • 10MB Ram • 500KB free disk space

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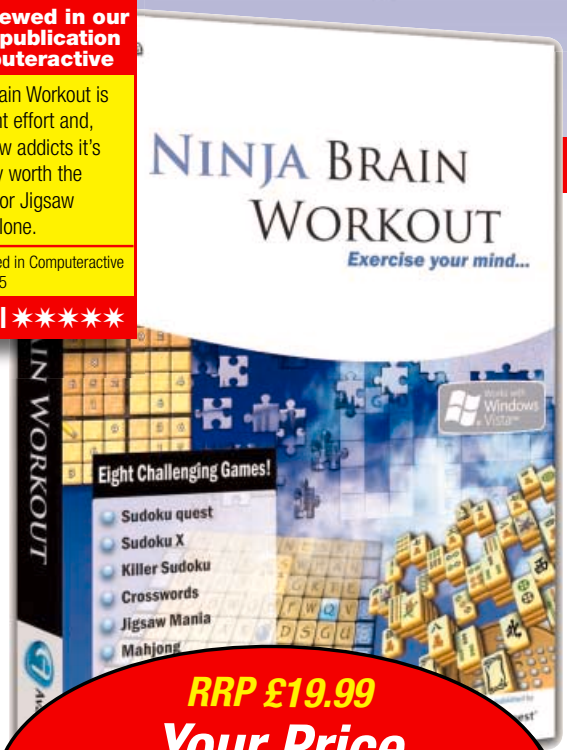
Overall ★★★★★



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System Requirements: Windows Vista/XP/2000 Pro, Pentium 500Mhz, 128Mb memory, 100Mb Hard disk space

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DOCUMENT MANAGEMENT

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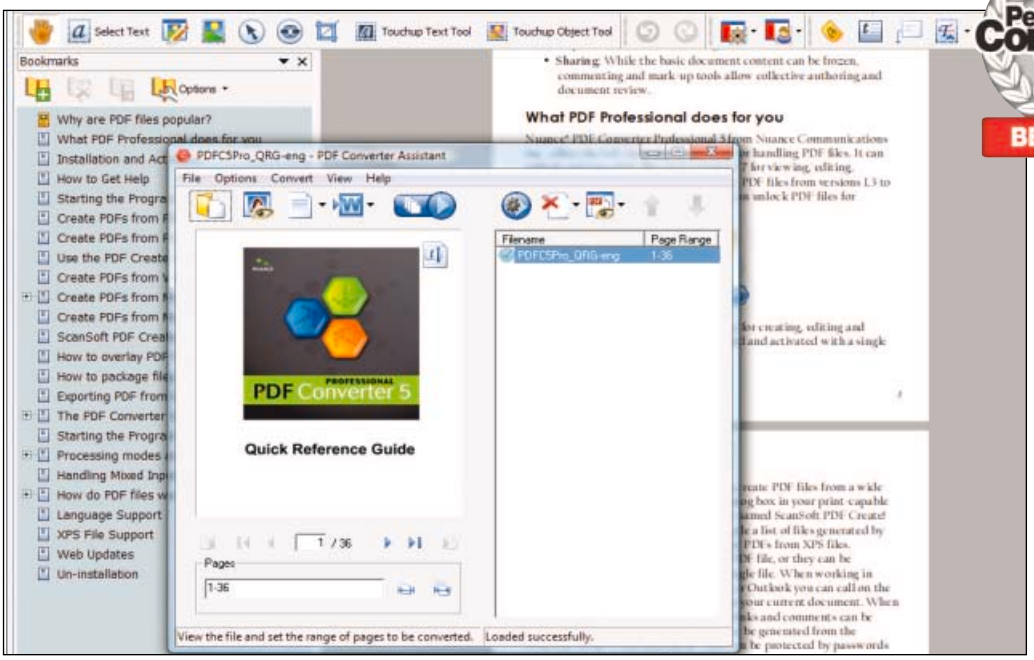

With PDF Converter Professional 5, you can convert editable Word and other documents to PDF format and back again

The Portable Document Format (PDF) and Adobe's Acrobat go together like bread and butter, but Acrobat isn't the only application capable of creating, editing and managing PDF documents. Running a close second in the popularity stakes, PDF Converter Professional from Nuance can do all that Acrobat can, plus a little bit more, for less.

Around a third of the price of the standard Acrobat package, PDF Converter Pro lets you turn almost any document into a PDF that can be read by any program that supports the format. Some documents are converted indirectly by printing to a special driver, but most from within the host application itself, with support for a wide range of programs including, naturally, everything Microsoft has to offer.

Of course, for that to be possible, suitable program extensions have to be installed, together with a variety of standalone converter tools, which are also included in the package. That, though, is all taken care of by the same setup program which, like the software itself, we found easy to use and understand. It's also pretty quick – the already very fast conversions have been further speeded up in the new version.

Other enhancements include support for PDF packages, as introduced in the latest Adobe PDF 1.7 format, and XPS, Microsoft's rival portable document technology. The ability to handle the new Office 2007 document types has also been added, along with facilities to embed sound and video files inside a PDF and include 3D objects, which can be rotated, panned and zoomed by the Nuance editing tools.

Distance, perimeter and area-measuring tools have been added, along with other tools to compare PDF documents, split a PDF, extract pages and add a table of contents based on bookmarks within a document.

Imposition facilities enable you to do booklet production, along with enhancements to stamps and watermarks, and the ability to search within PDF documents using Windows Desktop Search.

There's very little Acrobat can do that the Nuance software can't, and it also has a few tricks to teach the Adobe developers, not least the ability to convert PDF files to editable documents, ready for use in Word and other programs. This is done using Omni Page OCR (optical character recognition) technology, also owned by Nuance, which means it's subject to all the limitations that entails. But it does work and we were impressed by the accuracy of the results and the fact that, as well as the text itself, formatting and layout settings were neatly preserved in our conversion tests.

Document security is another area well catered for and enhanced in this release, while yet another new feature to catch our eye was the ability to archive Outlook email messages to PDF, complete with their attachments. Not only can this save on mailbox space, it will also help companies striving for regulatory compliance, especially those that currently print emails to provide an audit trail.

There's certainly a lot to PDF Converter Professional 5, and our only real concern is the need to understand and learn a range of different tools, many of which will rarely be used, if at all, such as the tool that can read out your PDF documents. Still, there will be users who want these options and it's better to have them than not. Indeed, for small companies looking for an affordable alternative to Adobe Acrobat, this is it. *Alan Stevens*

Verdict

Pros Fast and accurate; cheaper than Acrobat; converts to and from PDF; wide format support; archives email to PDF; good integration with host applications

Cons Large number of tools to learn

Overall It may take second billing to Acrobat, but the Nuance equivalent is cheaper and just as good, if not better

Features	★★★★☆
Ease of use	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £99 (£84.25 ex Vat)

Contact Nuance 01483 794 444 www.nuance.co.uk

System requirements

Pentium-class processor • 512MB Ram • 250MB free disk space • Windows 2000 or later (32-bit and 64-bit editions of XP and Vista supported)

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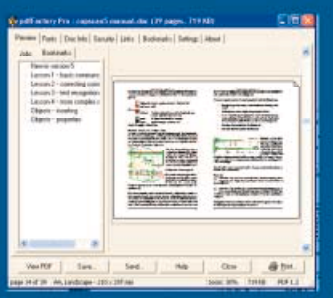

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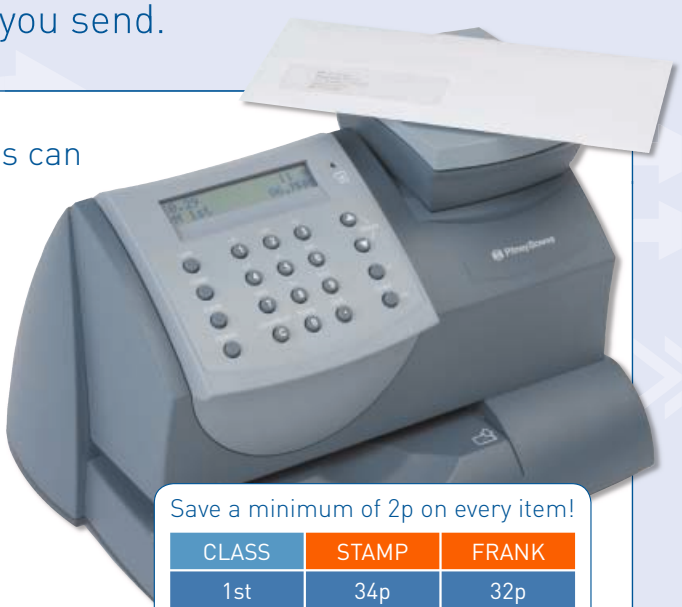

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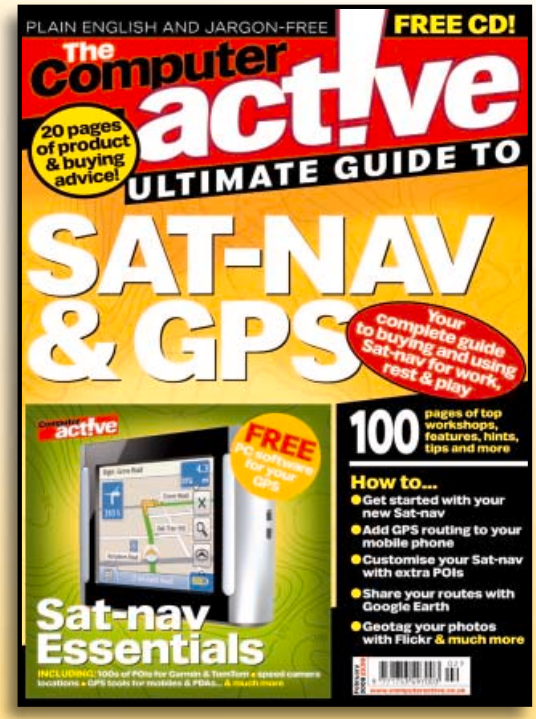

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(CODE PC12)

EDITED BY NIGEL WHITFIELD

HANDS ON

UPGRADE BY DOWNGRADING

In the world of computers, sometimes we prefer to stick with what we know. Vista is a case in point, and many people have been cautious about making the leap. In this month's Hardware and Performance columns, we discover the effects of changing back to XP on a modern laptop, while in Word Processing we show how you can achieve some of the functionality of Word 2007 in Word 2003.

If you're keen for a clearout, take a look at Digital Imaging where we look at the best way to take photos for selling online, while in the Sound column we explain how you can create your own ringtones for mobile phones.

We've also got some tips for NTFS users in the Windows column and continue our back to basics season in Databases. Spreadsheet users can find out about Excel's status bar and, in the Linux world, we have a look at the Fedora distribution. For Vista users, we've more on Service Pack 1 and how it will affect performance, and in Visual Programming you can learn how to make the most of the new Powershell.

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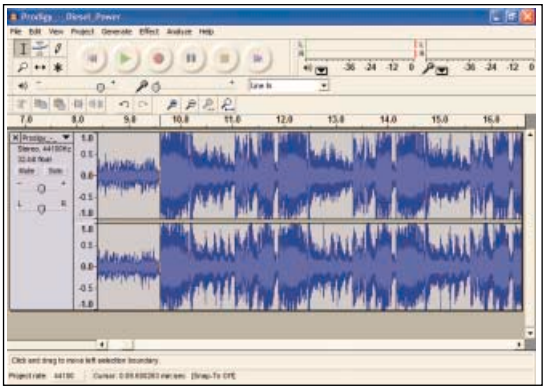

Far left: Create your own ring tones (see page 152)

Left: Scan or photograph items to sell on Ebay (see page 146)

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Advice from our experts

PCW's experts solve all your computing problems

DATABASES

Q I have just installed xampp on my Windows machine to get Apache, MySQL and PHP. I've looked at the MySQL documentation to try to create my first database, but it assumes I am using Linux.

I can't find any help on creating a MySQL database in Windows, which I assume you can do.

I would also like to know how to transfer data from an existing Access database – I am quite competent at creating relational databases using Access and Paradox and I assume the principles are the same.

Once I've mastered that, I'd be looking at incorporating it into a website – but that's probably quite a way off yet!

Barrie Potter

A My first port of call would be somewhere like **http://dev.mysql.com/doc/refman/5.0/en/windows-installation.html**. Transferring the data shouldn't be too much of a trial because Access can export in so many formats. One of them must be acceptable to MySQL. CSV and XML are the two I would try first.

DIGITAL IMAGING

Q I'd like to buy a digital projector so that I can give slideshows to smallish groups in smallish rooms. Hence, I don't need enormous power or range. Good movie capability isn't important, either. Any suggestions?

I also need a laptop to drive the thing. I have no other need to own a laptop so, again, expense becomes an issue. It occurred to me that the Linux pocket laptop featured in the March issue of *PCW* might be just the ticket; although it's short on memory, this could be supplied by the USB stick I'd need to use to transfer the images.

Does Linux offer a slideshow program? Could it be persuaded to run a show created in Photoshop Elements? Also, does it offer anything like Powerpoint? If so, and I am using that program but everyone else is using a Windows laptops with Powerpoint, perhaps any distribution of my presentations is going to be difficult. Perhaps I shall need a Windows laptop after all!

Eric Webb

For slideshows, a projector such as the Benq W500 needn't break the bank

A Our home projectors group test in the March issue featured several models at around the £700 price point (see Benq W500 pictured above) that would suit your purpose well – and they make a fine job of movies, too. Depending on your version, and whether you also have Premiere Elements, Photoshop Elements can produce slideshows in WMV, DVD video, VCD or Acrobat PDF format, so a Linux movie player with the right codecs, such as Mplayer, or Acrobat Reader for Linux will play them. For a Linux DVD slideshow-authoring tool try DVD-slideshow from **http://dvd-slideshow.sourceforge.net/wiki/Main_Page**.

'Impress, part of Open Office, is a good alternative to Powerpoint'

Impress, part of the Open Office suite, is a good alternative to Powerpoint and you can save presentations as .ppt files. So, it looks as if the Asus Eee PC 4G 701 might be the one for you after all!

HARDWARE

Q Having had an unsatisfactory computer experience six years ago, I have avoided buying another – using a subscription to your magazine and the steady diet of virus-threat stories to ward off any impulse to purchase, and using library-accessible internet and email instead.

This worked until a recent flurry of emails caused me to have to repeatedly drive the eight-mile return journey to my library. Gordon Laing's review of the Asus Eee lured me into buying the 2GB Eee for basic access, but it is only equipped for Wifi access.

As the broadband is poor in my area and I only want simple access, what is the cheapest method of getting the machine dial-up connectivity? I have no other computer or optical drive. Can Wifi do dial-up? Are the necessary drivers in this model, or should I consign the Asus to the back of the wardrobe?

John Townson

A The Asus Eee PC is also equipped with a wired Ethernet port, but that's not much use if you don't have anything to connect it to. What you're ideally looking for is a wireless 56K modem that uses Wifi.

The closest we could find was a £50 model by Zoom, but sadly it uses Bluetooth rather than Wifi for the wireless aspect. If you can find a Bluetooth dongle with drivers for the Eee PC's Linux, then you could be in luck, but it depends on how much you want to spend.

The other alternative is to buy an external 56K modem with a USB connection and support for the Eee PC's Linux. It's not wireless, but it's your best bet for getting your Eee PC online with a dial-up connection.

Dynamode's M56EXT-USB-T costs less than £20 on Amazon and has Linux drivers, but we can't verify whether these would work with the Eee. If you go for it, you'll also need

some means to get the drivers from the supplied CD onto your Eee – ask a friend to copy them on to a USB key or SD memory card. Contact **www.dynamode.net** for more details.

As a side note, the Eee PC does have space for a 56K modem socket, but all the versions we've seen so far have had this blanked.

Q With the impending arrival of my first grandchild, I'm being badgered to set up some sort of video link. Is it possible to use an old digital camera, and is there any software that avoids the Microsoft Messenger clutter that I've spent ages getting rid of?
Roy Houghton

A Most digital cameras are unable to deliver the required live video feed through their USB ports and so can't be used as webcams.

Even if they could, their battery and power-saving mechanisms would make them frustrating at best for this application. We'd advise buying a dedicated webcam – models such as Microsoft's VX1000 cost about £15.

As for software for video calls, we'd recommend Skype from **www.skype.com**. It's free of charge, but both parties will need a copy installed on their systems. You'll also both need broadband.

Q I get Digital TV through a Virgin Media set-top box that has an unused Ethernet socket on the back. Would I use a Patch or Crossover cable to connect to my notebook and what would be the possibilities?
Mike

A The Ethernet socket on your set-top box is for delivering Virgin's broadband service. If you have broadband as part of your TV package, you'd normally connect this port to a separate router.

Your PC, laptop and other internet devices would then connect to the router either wirelessly or with a cable.

SPREADSHEETS

Q Is it possible to create a SUMIF command that excludes a specific type of item? I have an Excel spreadsheet for my bank accounts. Sometimes I lay out money for my business, which is reimbursed.

I've created a SUMIF function to calculate how much I lay out for the business using:
`=SUMIF(B1:B10,"Business",C1:C10)`
That's easy enough, but I am unable to create a formula such as this:
`=SUMIF(B1:B10,NOT`
Nor one such as this:
`<>"Business",C1:C10)`
Am I doing something wrong?
Salo Heimann

A You could use the formula:
`=SUM(IF($B$1:$B$10<>↙`
`"Business",(C1:C10),0))`
(Key: ↙ code string continues)

Use Ctrl & Shift & Enter and Excel will add curly brackets to acknowledge it recognises that this is an array formula (see screen 1). An alternative, less elegant, solution would be to total the whole column and then subtract the business expenses, with the formula:
`=SUM(C1:C10)-SUMIF(B1:B10,↙`
`"Business",C1:C10)`

Domain name dilemmas

INTERNET

Q I am interested in owning my own domain name and have checked out various domain name providers that charge a very reasonable nominal fee; say, £10 for two years' registration of the name.

They also provide other attractive associated facilities as part of the package, such as unlimited email addresses, alias addresses, web-creation software, email forwarding, web URL forwarding, etc, which are advertised as being 'worth £80', for example.

However, it occurred to me, even though I am informed that the actual domain name re-registration would be either free with some providers, or just a few pounds with others after the initial two years is up, these hosts might then demand a hefty sum for continuing to provide all the aforementioned 'extras'.

I have emailed several of these sites asking this very question and I have been ignored by most of them or, if they did reply, the answer was very vague and still left me wondering.
Brian Lawrence

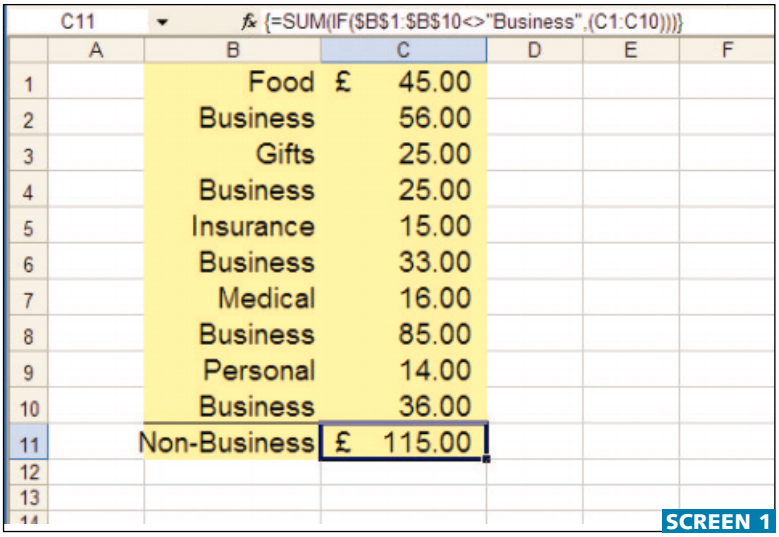
A In our experience, the domain name registration market is very competitive and it's most unusual to see prices rise after the initial registration, certainly if you choose one of the well-known companies. It's also, unfortunately, a sad fact that many companies base their business model on selling huge numbers of domains cheaply, via automated websites, leaving little time or money for answering questions such as yours.

On the whole, the special offers of web design software are seldom the latest and greatest packages, and we would not recommend you consider those when making a choice of Registrar. Look instead to ensure they're ICANN accredited, and check for fees in the small print should you wish to move your domain away in future – reputable registrars don't charge you to leave them.

It's also worth looking for sites that allow your domain to be 'locked', therefore making it harder for someone else to make unauthorised changes, and for ones that allow you full DNS control if you want it, so you can set up whatever you want on servers of your own if your site grows.

In *PCW's* Web Development column, we've used 123-Reg, Fasthosts, Free Parking and Easily from the UK, as well as Godaddy.com.

Use a reputable registrar such as Godaddy or Free Parking and you shouldn't have any unpleasant surprises when renewing your domain



	A	B	C	D	E	F
C11		fx {=SUM(IF($B$1:$B$10<>"Business",(C1:C10)))}				
1		Food	£ 45.00			
2		Business	56.00			
3		Gifts	25.00			
4		Business	25.00			
5		Insurance	15.00			
6		Business	33.00			
7		Medical	16.00			
8		Business	85.00			
9		Personal	14.00			
10		Business	36.00			
11		Non-Business	£ 115.00			
12						
13						

SCREEN 1

A variation on the SUMIF function

Q We manage properties that have differing financial year ends. I have been entering this information in a column with a simple date format of dd/mmm. I therefore end up with a schedule of properties and various year-end dates; for example, 31/03, 30/06, etc.

Sadly, when I try to sort these I do not end up with all the 31/03 properties together. Upon investigation I see that this depends upon the year in which I have entered this information. So, if I enter 31/03 when it's 2007 this will return a different number than if I enter 31/03 when the year is 2006 or 2008 and so on.

Is there a simple way round this? I have ended up adding a column with the month number so I can sort it that way.

Martin Cleaver

A If you only enter the day and month of a date, the spreadsheet will usually add the current year. It needs to add one year or another because what is stored is a count of days, typically from the start of the century. You can see this number if you display formulas instead of the normal display.

If you want to add a date from another year, always enter the date using d/m/yyyy. It's not enough to enter a two-digit year. In the default setup of Excel, for instance, if you enter 2/8/29 it will be displayed as 2/8/2029 because you are asking Excel to guess the century.

What is displayed in the cell depends on the formatting you have set up. What is stored, and what the spreadsheet will use for calculating or sorting, is the underlying date number.

Q I'm using Excel 2007. I need to sort a list of dates so that the current year is first and the oldest year last, but the dates within those years are in chronological order. How can I do that?

Syeda Shetty

A If your dates are in column A starting with cell A2, head the adjacent columns Year, Month and Day. In B2 enter:

```
=YEAR(A2)
```

In C2 enter:

```
=MONTH(A2)
```

In D2 enter:

```
=DAY(A2)
```

Drag these formulas down to the end of your dates. Click anywhere in the table. Under the Home tab click Sort & Filter, Custom Sort. Complete the first row of the Sort box so it reads, Year, Values, Largest to Smallest. Click Add Level. Complete the next row with, Month, Values, Smallest to Largest. Add a third level reading Day, Values, Smallest to Largest (see screen 2). Click OK. After obtaining your result you can hide or delete the extra three columns, if you wish.

Q The label on my cylindrical hot water tank reads, 36" x 18". Is there an Excel formula to convert those dimensions into its capacity in gallons?

Syed Irtizall

A Using a standard mensurration rule, it's easy to create one. The volume of a cylinder is Pi times the radius squared times the height. You can multiply cubic inches by 0.003605 to convert them to gallons (Imperial not US). So, if you enter 36 in cell B2, and 18 in B3, in cell B4 you can enter the formula:

```
=PI()*((B3/2)^2)*B2*0.003605
```

In your case, that comes to 33 gallons, but as such a tank probably has a domed top and pipes taking up space inside it's probably best to call it a 30-gallon tank.

WINDOWS

Q Try as I may, whenever I want to access the Windows XP Security Center to check the status section, I get a screen that tells me the Security Center has not started, or is switched off.

It then tells me to exit the window, restart and click on Control Panel, and then open the Security Center. All I get is the same screen again!

Dennis Broadway

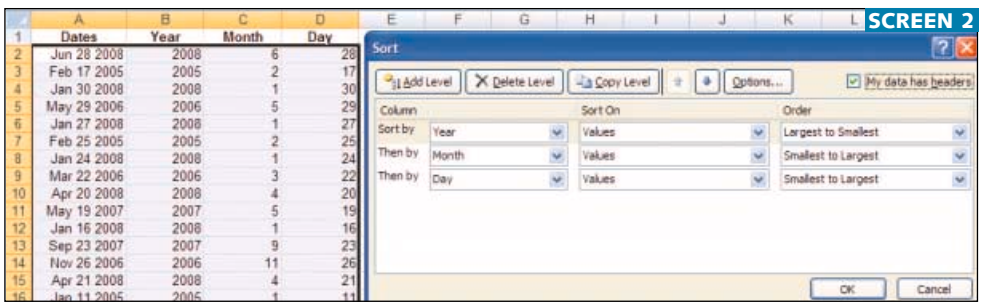
A This sounds as if the Security Center service is not running. Go to Start, Run and type Services.msc, then press Enter. Scroll down to 'Security Center' and check that its status is 'Started' and set to 'Automatic Startup' type. If not, double-click on the entry and you'll be able to rectify this (see screen 3).

Q Can you please tell me what facilities I can release by using the Print Screen key on the top of the keyboard?

Joe Leaf

A The legend on the Print Screen key (sometimes written as PrtScn or similar) goes back to Dos days, when it did – if you were

Sorting dates chronologically, but with the current year first



	A	B	C	D
1	Dates	Year	Month	Day
2	Jun 28 2008	2008	6	28
3	Feb 17 2005	2005	2	17
4	Jan 30 2008	2008	1	30
5	May 29 2006	2006	5	29
6	Jan 27 2008	2008	1	27
7	Feb 25 2005	2005	2	25
8	Jan 24 2008	2008	1	24
9	Mar 22 2006	2006	3	22
10	Apr 20 2008	2008	4	20
11	May 19 2007	2007	5	19
12	Jan 16 2008	2008	1	16
13	Sep 23 2007	2007	9	23
14	Nov 26 2006	2006	11	26
15	Apr 21 2008	2008	4	21
16	Jan 11 2005	2005	1	11

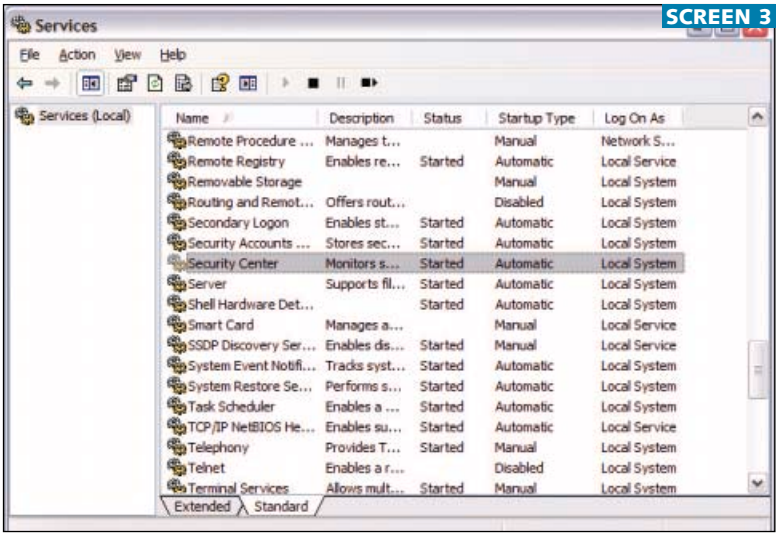
Sort

Add Level | Delete Level | Copy Level | Options... | My data has headers

	Column	Sort On	Order
Sort by	Year	Values	Largest to Smallest
Then by	Month	Values	Smallest to Largest
Then by	Day	Values	Smallest to Largest

OK | Cancel

SCREEN 2



Check the Security Center service

lucky – what it said on the key. In Windows, however, it copies an image of the desktop to the clipboard.

You can then paste this into an imaging program, such as Windows Paint, then save it, or paste it into a document.

If you hold down the Alt key when you press Print Screen, then just the active window or dialogue box is captured.

WORD PROCESSING

Q When I used Microsoft Word, there was an option to select an entire word automatically. I'm now using Open Office Writer, but can't find a similar option. Have I missed something?
John Church

A You haven't missed anything, but as with practically all Windows text-editing, double-clicking in a word will select it. Triple-clicking selects a sentence.

Click, then Shift-click elsewhere selects all the text between the two clicks.

Q Having installed Word 2007 almost a year ago, I wonder if there is a possibility of making a minor change to speed up one particular task. I make frequent use of watermarks when writing letters, in that I send copies of correspondence to other people with the word 'COPY' used diagonally as a watermark.

To do this I have to click on Watermark on the Page Layout ribbon. The dropdown menu has some preselected watermarks, but 'COPY' isn't included, so I then have to click on 'Custom Watermark', then 'Text Watermark' and then pick 'COPY' from the dropdown menu.

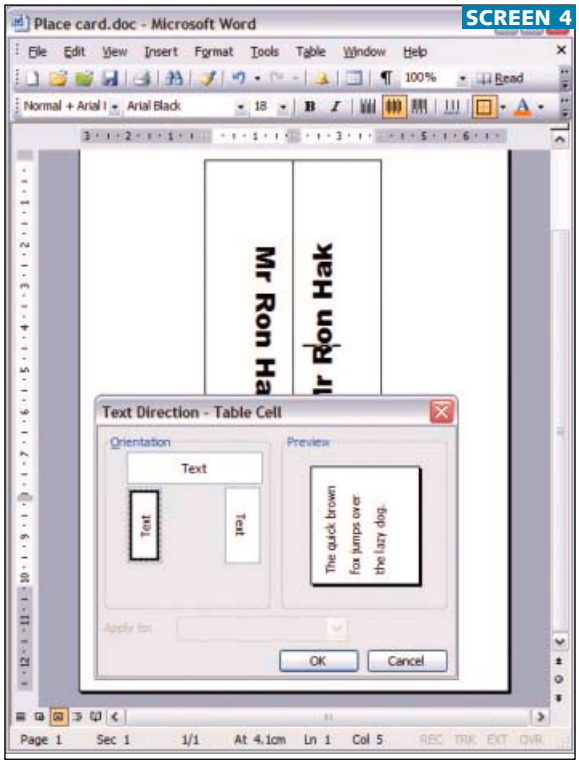
Is it possible to add 'COPY' to the preselected offerings?
Mark Appleyard

A Yes, but it's not quite as straightforward as the other Building Blocks we've covered in recent columns.

First, create your custom watermark. Then switch to the Insert ribbon, open Header, then Edit Header.

You will find that you can click on the watermark and select it. Just switch back to the Page Layout ribbon, open the Watermark gallery again, then 'Save Selection to Watermark Gallery'.

Print sideways for place cards



Q I am using Microsoft Word to create some place cards for a table setting where I want people's names visible on both sides of the card. I have created a suitable size table with required motifs and need to print one name the correct way up, and the other to be upside down and back to front.

I can do this by importing graphics, or using Wordart, but these are cumbersome methods. Is there a simple command to type upside down and backwards?
Ron Hak

A It isn't possible to type upside down in a word table or text box. But it is possible to run type sideways; that is, top to bottom or bottom to top. Just create a two-column, single-row table and set the left cell to run top to bottom and the right bottom to top from Format, Text Direction (see screen 4).

Q Although I'm getting on fairly well with Word 2007, there's one feature that has me baffled. If I type all or part of a date – April 2008, for example – and then start a new line, Word appends the current month and day. I'm sure there used to be a way of turning this off in previous versions.
Mike Ellis

A In previous versions, this could be disabled by unticking 'Show Autocomplete Suggestions' in Autotext options. However, according to Microsoft, this can't be turned off in 2007. If you press Esc before Enter, or press Shift & Enter, this will stop the behaviour on a one-off basis. **PCW**

LET US HELP YOU

All our experts welcome your queries. Please respond to the appropriate address below

Databases database@pcw.co.uk
Digital imaging & video digitalimaging@pcw.co.uk
Hardware hardware@pcw.co.uk
Linux linux@pcw.co.uk
Networks networks@pcw.co.uk
Performance performance@pcw.co.uk
Sound sound@pcw.co.uk
Spreadsheets spreadsheets@pcw.co.uk
Visual programming visual@pcw.co.uk
Web development webdev@pcw.co.uk
Windows win@pcw.co.uk
Word processing wp@pcw.co.uk

Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Hardware column.
Email hardware@pcw.co.uk
Please do not send unsolicited file attachments.

Portable power

Ensuring peak performance from your laptop may mean 'downgrading' to XP

With each new version of Windows, Microsoft introduces technologies it claims will improve performance, but the end result isn't always a faster experience. Greater overheads along with more sophisticated visuals and indexing can seriously impact overall performance, and one of the greatest offenders in these respects is Vista.

Every owner of Vista has experienced the constant disk chatter after startup, as the Superfetch (and optional Readyboost) caches are populated. Both technologies can improve overall performance once they're populated with data, but that process can render PCs unusable for the first few minutes after power-up.

In last month's column we benchmarked a freshly unpacked Sony TZ-series laptop running Vista and were shocked at how slow the default shipping configuration was. At first glance the blame could be levelled at Vista running on modest hardware but, upon closer examination, the bigger culprit was a system clogged with promotional software trials and unnecessary startup items.

After a spring clean, the laptop was performing quite respectably. In this month's Hardware and Performance columns, we're measuring the impact of a memory upgrade along with the ultimate salute to Vista: wiping the hard disk and 'downgrading' to Windows XP. The latter is a more involved process, so we're devoting the Hardware column to it.

'Downgrading' to XP

Windows XP is seen by many enthusiasts as a swift, efficient and reliable alternative to Vista, without compromising on functionality and support for modern devices. As such, it's not surprising that the solution to countless threads of laptop forums complaining of poor Vista performance is to 'downgrade' to XP.

The Vaio TZ150N ultraportable laptop looks great, but the default Vista configuration results in lousy performance. 'Downgrading' to Windows XP, though, resulted in a transformation in speed

The big issue with laptops though is that there are a number of often proprietary system components that require drivers to operate properly – and many modern laptops designed for use with Vista may not have drivers for older versions of Windows.

One solution is to re-use XP drivers for older models from the same company, as these can sometimes work fine. Of course, the device functionality may be reduced, or the older driver may not work at all, but it's a trial-and-error process that many dedicated enthusiasts have gone through – so before taking the plunge, do a web search for XP drivers for your particular laptop to see what's available and what others have achieved with older software. A great resource for laptop users is **http://forum.notebookreview.com**.

Ideally the manufacturer will realise there's sufficient demand for XP drivers and provide them itself. These are often posted 'as-is' for enthusiasts to try, with disclaimers that you may not subsequently enjoy the complete functionality of your laptop.

When installing an OS on a laptop, there's more than just drivers involved. Fortunately Sony also provides versions of its battery, power and hard disk protection utilities for those installing XP

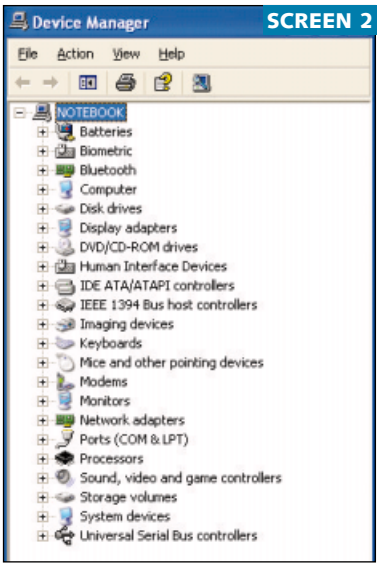
Sony is one such manufacturer, with its Vista laptops being criticised in many forums for disappointing performance. So in September last year, it posted a set of XP drivers for all the Vaio computers that it shipped with Vista – see **http://esupport.sony.com/perl/news-item.pl?template=EN&news_id=221**.

Sony explains that these drivers are "intended to provide basic system functionality under Windows XP" and adds "because these computers are optimised for use with Windows Vista, some functionality will be lost under Windows XP". For example, some function keys and special buttons may not work properly, while the battery life may not be as good.

We decided to 'downgrade' our own Sony Vaio TZ series laptop to see how XP compares with Vista on this popular ultraportable model.

Installing XP on a laptop

Installing Windows XP on a laptop is essentially no different from installing it on a desktop. You'll boot from the



Sony provides XP drivers for its Vista computers for anyone who wants to 'downgrade'. Despite the disclaimers we experienced no problems downgrading our Vaio TZ150N and, as Device Manager shows here, no pesky exclamation marks

XP CD, install it on the desired partition then, once complete, install the required drivers for the various devices. Since your laptop may not have access to the internet straight away, it's a good idea to download the drivers using another system first and copy them either on to a CD or a Flash memory key for easy access. And since the 'downgrade' will involve wiping the hard disk, it goes without saying that you should back up important data before proceeding.

Our test laptop was a Sony Vaio TZ150N, bought in the US, and searching for it under the drivers and software section of Sony's support website at **http://esupport.sony.com** brought up a full list of downloadable options for Vista Business and XP. Filtering the list for XP listed 32 drivers and utilities – we downloaded and copied them to a USB memory key.

With the drivers downloaded, we inserted the Windows XP CD into the laptop, restarted and began the Windows setup process; if your CD doesn't automatically start, enter your Bios settings and set the optical drive as the first boot device.

After Windows completed its setup process, we installed the downloads one by one, starting with a Bios update followed by the chipset and graphics drivers, before working through the others. Sony advises doing these in a certain order and provides a list to follow. The process went smoothly.

After installing the Intel graphics drivers for instance, Windows Device Manager still showed a couple of exclamation marks against VGA devices, but pointing these towards the downloaded Intel folder gave them the information they were looking for.

Likewise, a couple of unidentified base components were happy when fed the Sony drivers for the Memory Stick and SD card slots, while the Realtek audio was satisfied with a further download from Windows update. Windows XP also thought it had correctly identified the built-in webcam during the initial setup process, but unfortunately it didn't work with Microsoft's drivers. Installing Sony's own camera driver, though, did the trick. Finally we installed the Sony utilities, including those for power management and anti-shock hard disk support (see screen 1). The entire process took just less than three hours.

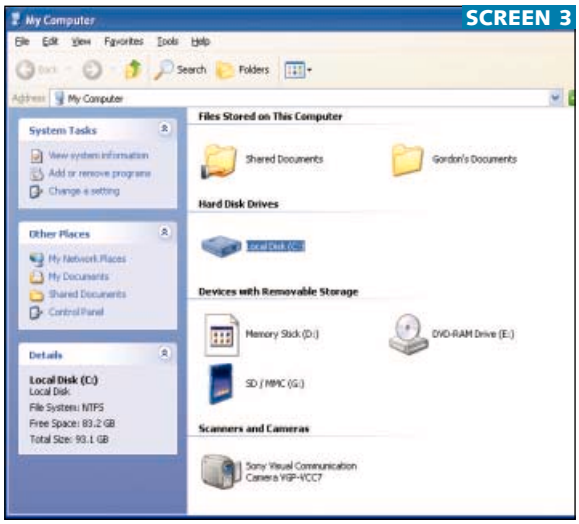
Was it worth it?

Before performing any formal tests, the laptop felt much quicker and responsive under Windows XP than it had with Vista. In terms of performance, the laptop previously took one minute and nine seconds from cold power-up to the Vista login screen, and a further five minutes after logging in before the disk activity slowed to point of usability. So from cold power-up to productivity with the default configuration, you were looking at about six minutes in total.

In last month's Hardware column, we managed to cut that period down following logon to about a minute and a half, but in total from cold power-up, you were still looking at about two and a half minutes.

In stark contrast, our new Windows XP installation took just 55 seconds from cold power-up to complete readiness, with all the Sony startup utilities loaded and ready for action. That's a serious improvement over the default Vista configuration as shipped,

Wiping Vista and installing XP freed up a lot of spare storage on the TZ150N from its default configuration and, to date, the only aspect we haven't got working under XP is an icon for the Memory Stick



and over two and a half times quicker than our best tweaking effort.

Shutting down was quicker too: the default Vista configuration took almost a minute and a half, while the new XP installation was completely powered down in 32 seconds.

Despite Sony's disclaimers, everything appeared to work fine too, with no exclamation marks in Device Manager (see screen 2) and all of Sony's front-mounted buttons, keyboard function keys and both the battery and hard disk protection utilities happily talking to the hardware. The Wifi, audio and webcam were all operational, and the processor was also automatically adjusting its speed depending on load.

Not only was the laptop quicker, but there was also significantly more hard disk space free. The shipping configuration with Vista had only half of its 100GB drive free for use and, while 7GB had been reserved for a recovery partition, that's still poor.

After creating one partition for XP using all the available space and fully installing the operating system and all the Sony drivers and utilities, the laptop now had 88.5GB of 93.1GB remaining (see screen 3). That's better.

Startup benefits

Last month we demonstrated how spring cleaning the junk from even a brand-new Vista system can seriously improve its startup performance, but if you're willing to dispense with Vista entirely, there can be greater benefits by switching to Windows XP.

It may seem like a step backwards at first, and indeed XP is missing many of Vista's bells and whistles, but if quick startups and a responsive system are more important to you than Flash features, then it's well worth considering. 'Downgrading' to XP transformed our test laptop and, while it's still early days, we'd highly recommend considering it on any Vista model that's struggling.

Of course, the key to a successful downgrade is having the right drivers available, so always check with your manufacturer first and if they don't yet offer any XP drivers for a Vista model, put a request in. Enough people complained to Sony for it to offer decent XP support for its Vista models.

If you've downgraded a Vista laptop or desktop we'd love to hear about it. We'll also report on any long-term issues in running XP on a laptop originally designed for Vista. **PCW**

Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Performance column.
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Bridging the memory gap

Can adding memory to your laptop have unforeseen consequences for Vista users?

In this and last month's Hardware columns we've been looking into ways of improving the performance of laptops running Windows Vista. The various caching technologies used by Vista may improve performance once your system is up and running, but at the cost of slow startup times.

In this month's Hardware column we've switched our test laptop from Vista to XP. Here we'll examine the effect of adding more Ram to both the Vista and XP installations.

Installing Ram in a laptop

Laptops may be fairly restricted in terms of hardware upgrades compared to their desktop counterparts, but increasing the Ram is fortunately quite straightforward. Most laptops use Sodimm memory cards, which are smaller than traditional desktop Dimms. Small to mid-size laptops will normally have one memory card slot, while bigger models may have two.

These slots are generally accessible from behind a removable panel on the underside of the laptop – indeed on many laptops, it'll be the only part of the case you can 'officially' open. The slots also work in the same way as desktops, with a clip on each side holding the Dimm card in place. Before opening the case and replacing memory, we'd recommend removing the battery and AC power cord.

The prices quoted by laptop manufacturers for memory upgrades could have you fearing the worst, but it's quite affordable when sourced independently. As with desktop memory, we'd advise entering your model into online databases such as those of Crucial at **www.crucial.com/uk**. There we found that while our Sony Vaio TZ150N laptop only had one slot, meaning the existing 1GB Sodimm would have to be removed, we could fit a brand new 2GB Sodimm for just £30.99 inc Vat. Once the part arrived, we had it fitted in minutes.

Installing extra Ram in your laptop will improve overall performance, but under Vista could result in slower startup times as the cache is populated

Results

Following last month's Hardware column, we timed how long it took from the Windows login screen to the point at which disk activity fell and consistently stayed below five per cent. We also timed how long it took to launch Photoshop CS3 once, followed by a second time (giving Vista a chance to cache it), and finally the time taken to completely shut down.

The Vaio TZ150N's shipping configuration with Vista and 1GB of Ram hammered the hard disk for just over five minutes after logging in, during which time it was effectively unusable; it even took over three minutes before the gadget sidebar appeared on the desktop.

Launching Photoshop CS3 for the first time took 25 seconds, but closing and relaunching saw it cached and ready for action just six seconds later. Shutting down took just under a minute and a half.

As documented in last month's Hardware column, reducing the 26 startup items to eight essentials saw the time to low disk activity fall to just over a minute and a half, and shutting down took 56 seconds. Application launch times weren't affected.

With the Ram doubled to 2GB our hopes were raised when the gadget sidebar appeared a relatively swift 20 seconds after logging in, but the disk kept chattering for almost eight minutes. That said, Photoshop subsequently launched in just six seconds the first time and five after that, while shutting down was quicker at 39 seconds.

The longer startup time shouldn't be surprising as there's simply more memory for Vista's Superfetch to use as a cache. Once fully populated, the benefit of the extra Ram was apparent, with applications launching faster along with a feeling of quicker response. But it is important to note that doubling the Ram significantly slowed Vista's startup times.

In an attempt to enjoy the best of both worlds, we disabled Superfetch, after which the startup time fell back down to a much more reasonable one minute and 39 seconds. The casualty was application launch times, with Photoshop taking 19 seconds the first time, although this fell to six seconds on subsequent launches.

After installing XP we repeated the tests with 1GB and 2GB of Ram and noted no difference in startup, application launch or shutdown speeds. But in terms of general use, especially with multiple applications running, the 2GB configuration felt much more responsive.

Thanks for the memory

Increasing Ram is a well-known solution for improving performance, but Vista's Superfetch technology will simply take longer to fill it – and with slow laptop hard disks, that can result in a noticeably longer delay before the system becomes responsive.

That said, there are benefits to upgrading the Ram in a laptop and it's possible to find a balance between startup and application performance. Just don't assume you'll get them with the default Vista configuration. **PCW**

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Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

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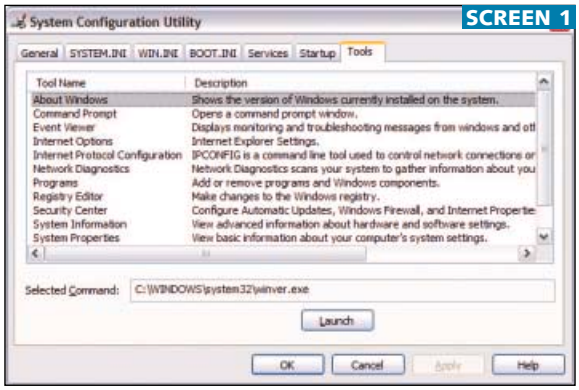
This appearing act

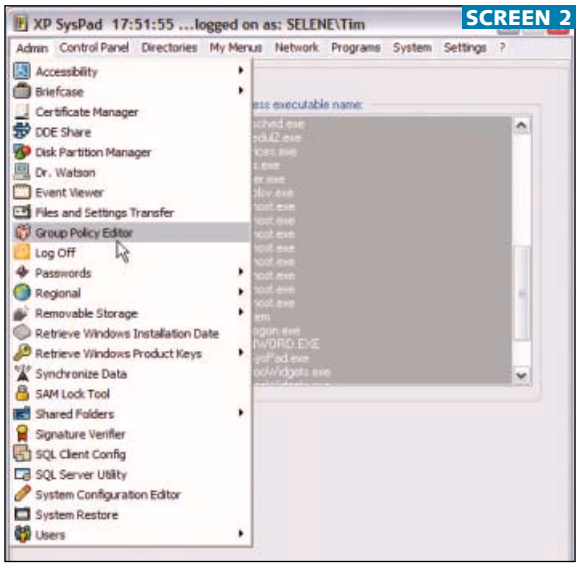
The mystery of a new Windows tab solved and how to find files in XP

Being a frequent user of the XP System Configuration Utility (Msconfig.exe), I was rather surprised to see that it had suddenly sprouted another tab, entitled Tools, just like the Vista version (see screen 1). This provides shortcuts to all sorts of commands that sometimes take a lot of rummaging through the Start Menu or obscure buttons in remote dialogues. Among those on offer are the System Information tool, the Event Viewer, and Network Diagnostics. Other items here, such as System Properties and the Command Prompt, are more accessible, but it's useful to have them all in one place. It appears this came with XP Service Pack 3, but it is available for download separately. It doesn't appear to be available via Windows Update, but you can download it from **http://support.microsoft.com/kb/906569**. The same page also shows you how to customise the list of tools, should you feel brave enough to dabble in some XML code.

If you fancy a third-party toolbox, try XPSyspad (see screen 2). This provides access to administrative and system tools, Control Panel items and special folders. It will recover Windows and Office product keys, and there's even a process viewer. You'll find it at **www.xtort.net/xtort-software**. Despite the rather alarming domain name, we couldn't find any trace of malware.

While on the subject of Msconfig, one irritation is that the window is not resizable. This is especially irksome if you are trying to see the command path or Registry location of an item in the Startup tab. Even if you widen a column by dragging the division between the column headers to the full width of the window, it often still isn't wide enough. Purely by accident, however, I discovered that if you keep dragging the divider right out of the window, the column continues to widen past the available space. So, by judicious use of the horizontal scroll bar, you can see the entries in their entirety. This also works in other fixed-size windows in XP and Vista, such as the Defrag report.





Top: A new tab for MSConfig

Bottom: All the tools in one big box

A good hiding

There's a cunning way of hiding files from others who might have access to your XP computer. You will need an NTFS partition, a file to act as a hiding place, a file to hide and a command prompt window. Assume the partition is C: and create a new folder therein named 'Hideaway'. Copy to, or create a text file in Hideaway with a sentence or two in it. Let's call this justtext.txt. Copy the file you want to hide into Hideaway. This can be any file, but for this experiment we'll use the Windows Solitaire game at C:\Windows\System32\Sol.exe.

Now open a command prompt. Assuming this starts somewhere on the C: drive – it should default to your profile folder – type 'CD\', followed by Enter, then 'CD Hideaway'. You should now be 'in' the new folder and see C:\Hideaway> as the command prompt. Now type the following line, then press the Enter key, making sure you get the spaces, punctuation and symbols exactly as shown:

```
type sol.exe > ↙
justtext.txt:sol.exe
```

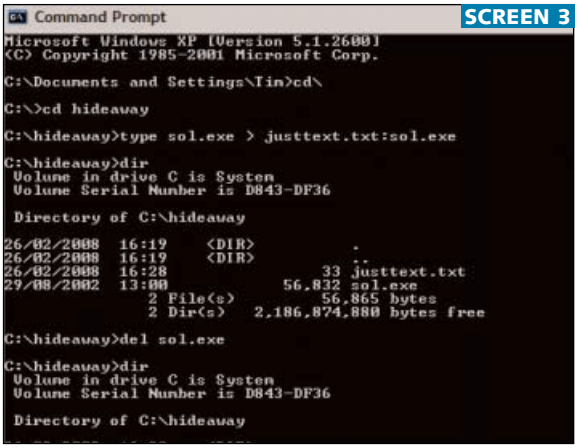
(Key: ↙ code string continues)

Nothing will appear to happen. There will be no message in the command window – just a new prompt and the contents of the folder will look the same – a text file of the original size and the majestic 56KB of sol.exe. Only the modified date of the text file will have changed, and opening it will merely show the original text content. Just to show there's nothing up your sleeve, you can delete the copy of sol.exe.

Now, at the same command prompt, type the following, again paying attention to the spaces and punctuation, and following it with the Enter key. It's an oddity of the Start command that it needs the entire path to the file:

```
start c:\hideaway\↙
justtext.txt:sol.exe
```

Lo and behold, a game of Solitaire will commence. You can see the whole process in screen 3. You can hide any file type in any other file this way. So how does it work?



This message is triggered by an ADS

NTFS supports Alternative Data Streams (ADS). In other words, one file can be associated with more than one set of data, which is the trick we've just performed. If you read the NTFS entry in Wikipedia you'll find more than you ever wanted to know. Fat32 doesn't support ADS, so if you try to copy a streamed file to, say, a Fat32 USB key, you may get a message telling you this, as well as revealing the name of the hidden file. Emailing a file as an attachment also strips out ADS, as does sending the file to a compressed (ZIP) folder.

Windows does use ADS for various obscure tricks of its own: some files have a Zone Identifier added in this way when you download them. It's this that triggers the security warning when you open some downloaded files (see screen 4). If you clear the 'Always ask…' box, or click the Unblock button in the file's property sheet, the ADS – and the warning – will be removed. Another example is 'favicons' – the icons you see next to sites in your IE Favourites folder are hidden in the Internet Shortcut files. This technique could be used to hide malware and ADS Spy, a utility to scan your drives, can be found at **http://tinyurl.com/jp5m4**.

Alternative Data Streams via the command prompt

Quick new folder

If you're a fan of the Quick Launch toolbar, here's a rather neat way to save yourself all of two clicks whenever you want to create a new folder. Right-click in the Quick Launch toolbar and select Open. This will show the Quick Launch folder buried deep within your profile. To create a new folder, right-click, New, Folder. You can leave the default name or choose another name. Close the Quick Launch folder and you'll see a new Folder icon on the Quick Launch toolbar. If you Control & Drag this to any open folder (or the desktop) you'll get a new folder in the target. This works with any Windows version that has a Quick Launch toolbar.

Although NTFS is far superior than Fat in terms of reliability, it does have one peculiar foible. Every time you access a file or right-click and view its properties, even if you don't change or save it, this event is recorded as the 'last access time'. This takes a little time and isn't a great benefit to most users, unless they have backup programs that use the Remote Storage Service. You can turn this off in Vista and XP Pro by opening a command prompt and typing:

```
FSUTIL behavior set ↙
disablelastaccess 1
```

Replacing 1 with 0 turns it back on and:

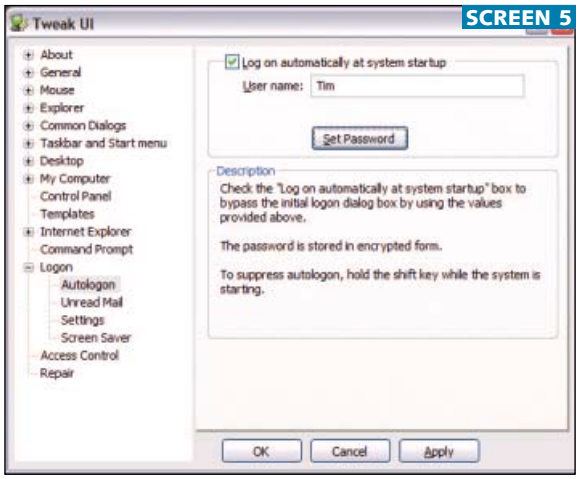
```
FSUTIL behavior query ↙
disablelastaccess
```

reports the current state.

Skip the welcome screen

If you have more than one user account in XP but always want to log on to a default account rather than use the welcome or log-in screen, you can do this with TweakUI – the free but unsupported Microsoft tool for XP (see screen 5). Vista has a hidden way of achieving the same end. In the Start, Run box, type NETPLWIZ. This opens the Advanced User Account dialogue. First select the user you want logged on automatically, then clear the 'Users must enter a password...' box. Click the Apply Button, then Enter and confirm the password for the chosen user. This doesn't affect logging off or fast user switching in either operating system.

Dive straight into your user account



Gadget of the month

It has been a while since we had a bit of culture in this column, so here's a Vista Sidebar gadget that brings you a masterpiece from the Rijksmuseum. Click on the painting to enlarge it, then 'turn it over' to read about the work and the artist. You'll find it at **www.rijksmuseum.nl/widget**.

If you're using XP, you can also get a daily dose of Dutch mastery, as there's a Yahoo Widget available. You'll first need to download the Yahoo Widget Engine from **http://widgets.yahoo.com/download**. Pay attention when you install this, as you need to clear two checkboxes if you don't want Yahoo as your home page and default search engine. Having installed this, you'll have a sidebar similar to the Google one mentioned in April's column, except that it is not transparent and has some annoying Yahooish features, such as taking over your desktop in 'Heads Up' view.

Pssst!

In April's column, I said that "deleting mail and emptying Deleted Items in Outlook 2007 actually increased the size of the message store (.dbx) file". That should be .pst, not .dbx, which is the Outlook Express format. To perform a manual compress, go to File, Data File Management..., select 'Personal Folders', click 'Settings', then 'Compact Now'. **PCW**

Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time he prefers to travel the world – and snap it with his camera.

→ Comments welcome on the Linux/Unix column.
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The changing face of Fedora

Ubuntu may be the most popular desktop distribution, but Fedora support is strong

Regular readers will know that Ubuntu Linux is often the focus of this column. The distribution has come to dominate mainstream Linux use outside corporate server rooms.

Indeed, a check on Google will show more results for searches on Ubuntu than any other Linux distribution. Ubuntu is, in fact, one of the youngest distributions; the first version (Warty Warthog) was released in October 2004.

The reason it has managed to gain such a foothold in just a few years is because, from the outset, it aimed at providing a stable, polished desktop environment, with a carefully chosen selection of installed applications.

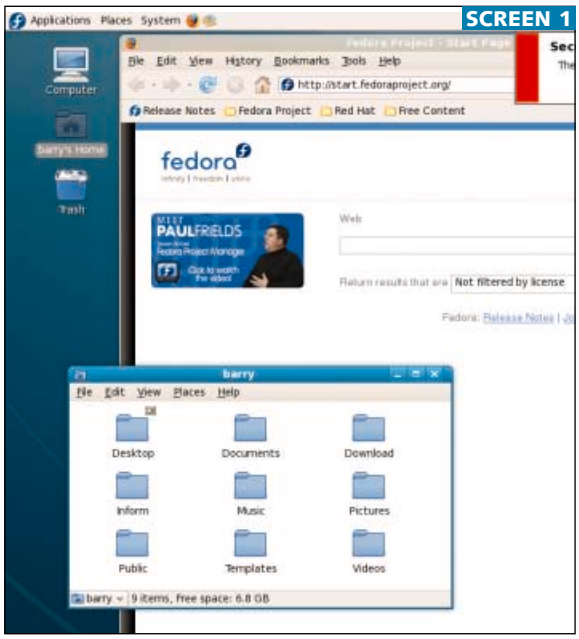
Before Ubuntu, an installation of Linux would usually involve having to select the applications you wanted, and you might well have ended up with several different ones for the same kind of task, such as four or five text editors.

While Ubuntu is almost certainly the most popular desktop distribution, there are, of course, others that are also popular. Distributions can loosely be divided into two categories: commercial and non-commercial. The former includes Red Hat Enterprise Linux, Suse Linux Enterprise, Mandriva Linux and Xandros Linux. The latter includes Ubuntu Linux, Debian, Fedora, Opensuse and others.

A few years ago, it seemed as if a new distribution was being released every week. Thankfully, while there are still a huge number of minor distributions, the list of the major ones is a lot smaller, and Linux development has benefited from this.

A short history of hats

Long before Ubuntu was around, Red Hat Linux was almost synonymous with Linux itself. It was one of the first distributions to exist, back when an installation meant writing raw floppy disk images in MS-Dos to create bootable disks.



The Nodoka desktop theme contrasts with Ubuntu's dark browns

In 2003 Red Hat was growing substantially in the corporate server market and the company decided to end support for the venerable and popular consumer-orientated Red Hat Linux. In its place came Fedora Core, which was intended to be a community-driven project.

The Core repository gave a basic functional desktop, while the Fedora Extras repository provided many unofficial (but essential) extras. Fedora was largely controlled by Red Hat, and many users and developers felt it was just a public beta testing ground for future Red Hat Enterprise releases. This, together with the confusion over Core and Extras, led to little enthusiasm for the project and may have contributed to Ubuntu's success.

In May 2007, Fedora 7 was released. Core was dropped from the name, as the two repositories were merged. Support also moved to the Fedora Project, which has meant more active development from the open-source community.

With Fedora 7 also came 'spins', a method of creating custom builds of Fedora from the software available in the repositories. For example, two spins were created for a KDE and Gnome live CD, and another spin for a DVD installation of Gnome, with a large selection of applications. These spin releases compare well with Ubuntu's desktop variations – one CD for a Gnome desktop, and two others for KDE and XFCE.

In November came the release of Fedora 8. Fedora has often stayed ahead by incorporating some of the latest developments in open-source software. This remained true with Fedora 8, which introduced Pulse Audio (**http://pulseaudio.org**), an advanced sound server that offers lots of control over how sound is produced.

The desktops available are the latest versions of Gnome (2.20), KDE (3.5) and XFCE (4.4), together with Compiz Fusion, the impressive compositing manager for 3D desktop effects. Network Manager (also found in Ubuntu) was added to provide better support for wireless networks and switching between networks, and an easy-to-use graphical firewall admin tool is offered for those who want it.

The package management system's performance was markedly improved, making it somewhat comparable to Debian and Ubuntu's equivalent, apt. Also included is Policy Kit, an authentication system that allows selected operations of an application to gain super-user (administrator) access, meaning better security and better control over what applications can do.

Both Policy Kit and Pulse Audio are making their debut in Ubuntu 8.04

(Hardy Heron), approximately one release behind Fedora.

Fedora is a completely free distribution and contains only free software not affected by copyright restrictions or patents. In other words, on a plain install, it will play next to none of the popular media file formats. Audio CDs, Ogg Vorbis and WAV files are fine, but MP3, AAC and MPEG4 files or video DVDs will not play. One solution to this is Codeina, a small application that runs when you try to play an unsupported format. This can download and install a plug-in that will enable applications such as Totem to play back the file. A free MP3 plug-in is available for download, but there is a charge for other formats.

Few people will want to pursue this option, especially as it is completely unnecessary. Ubuntu gets around the patent problem by informing the user via a pop-up window that in some countries (the US), patent restrictions may be in place, but will still allow you to download and install the free software. In Fedora there is no such official alternative, which discourages many people from using Fedora as their main desktop. Fortunately, there is an unofficial workaround – the Livna repository (see box above).

Installation

Fedora will install onto any modern PC desktop or laptop. The recommended specifications for a smooth-running full desktop are typical for a Linux distribution: around 512MB of Ram and a 1GHz processor. As mentioned above, Fedora is released now as a set of official spins, either by direct download or via a torrent.

The standard desktop spin is with Gnome, and is available in Intel/AMD 32-bit (Pentium II or later), 64-bit or Power PC versions. An equivalent KDE-based release is available. For older systems, a standard installation spin for 386 (or better) processors, as well as the 64-bit and Power PC versions, is also available.

For most people, the i686 (32-bit) Fedora Desktop Live Media release is recommended. Download links are at **http://fedora project.org/get-fedora.html**.

The installation process has changed little from earlier releases. As with Ubuntu, there are few choices to make and so little opportunity to do anything wrong. The partition editor lets you set up your hard drive for installation, and to dual-boot with Windows if required. Fedora will set up logical volumes if left to organise your drive itself, something very flexible but confusing to people who want to modify the layout later.

Fedora 8 introduced new artwork, known as Nodoka. A blue and fairly pale professional theme, it contrasts with Ubuntu's infamous (and often unpopular) dark browns (see screen 1). Fedora also includes a nice, if somewhat gimmicky, touch in that the desktop wallpaper will switch to slight variations in colour, depending on the time of day.

A set of useful applications is installed by default, including Abi Word, Mozilla Firefox (of course), and Evolution. Surprisingly, Open Office is not contained on the single-CD spin, but, just as with Ubuntu, an Add/Remove applications tool is provided, where you can install additional software from the repository in just a couple of clicks (see screen 2).

Also similar to Ubuntu, a software update tool runs in the background and notifies you of any new releases. Fedora tends to track updates to the Gnome desktop more than Ubuntu, so updates are generally more frequent.

Hardware support is generally good. Work has been done to make everything 'just work' as much as possible: display resolutions should be detected automatically; USB sticks will pop up a Nautilus window; and so on. Intel drivers are included, so there will be no problem getting wireless access if you use an Intel-based laptop.

Ubuntu usually comes out slightly ahead with ease of use for hardware, though Fedora has begun to catch up.

Post installation

The first thing to do after installation, if you want reasonable multimedia support, is to set up the Livna repository. Since Fedora uses a similar way of organising packages to Debian and Ubuntu, the packages from Livna are available immediately through the standard utilities. Packages include VLC, Xine, mplayer, gstreamer restricted plug-ins, libdvdcss (for playing back video DVDs) and binary Nvidia and ATI graphics drivers.

Adobe's Flash plug-in is not available from Livna, but is easily installed by going to Adobe's website and downloading and installing the RPM file directly. **PCW**

Livna fills some gaps

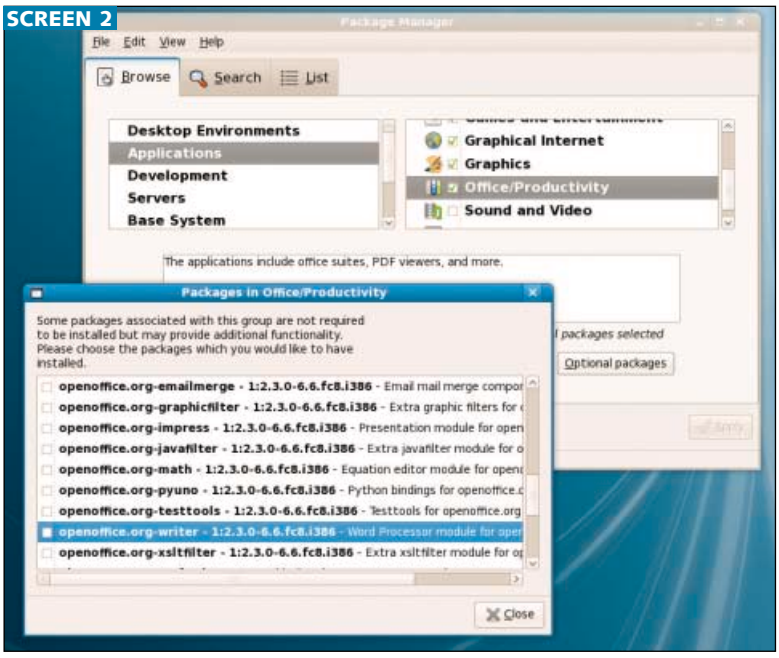
Fedora's policy of only having free, open-source software means many useful packages that have restrictions in copyright or patents are not available.

The Livna repository provides a set of packages to fill this gap, though it should be emphasised that these are unofficial and not supported by Fedora in any way. However, the repository is used by most Fedora users, and is regularly updated with fixes and updates.

To make the repository available in Fedora 8, head to **http://rpm.livna.org** and download the Fedora 8 repository RPM. Install the RPM file by clicking on its icon.

'Distributions can loosely be divided into two categories: commercial and non-commercial'

SCREEN 2



Adding extra software from the repositories is very straightforward

Ken McMahon is a freelance journalist and graphic designer. His involvement with digital cameras began with a Commodore 64. He graduated to Macs and now works mostly with PCs.

→ Comments welcome on the Digital imaging & video column.
Email digitalimaging@pcw.co.uk
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Selling an image

How to take studio-quality photos to help sell items on Ebay

I've just put my old wireless router on Ebay. It's less than a year old, but when I upgraded my BT broadband package they gave me a new one, so I figured I'd sell the old one while it was still worth something.

Don't worry, you haven't taken a wrong turning and lost yourself in the networking section. It's just that every time I sell something on Ebay, I need to take a picture of it. And to differentiate my router from all the others and make my offering more professional-looking, desirable and saleable, I like it to be well photographed and on a nice clean white backdrop.

It's not just Ebay; photography is more and more a part of everything we do these days. And whether you're auctioning old kit on Ebay, producing images for your business website or taking photos of yourself for a passport or driving licence application, you want them to look as good as they possibly can.

I'm going to show you how to take studio-quality product shots without a studio. There are two aspects to this – what you can do when shooting (you'd be surprised how far a sheet of white paper and a window can get you) and what you can do after the event using a photo-editing application.

Shooting small objects

'Product shots' could really mean anything, but here I'll confine it to small objects such as my wireless router. The only thing the viewer is interested in is the subject itself, so the aim is to show it as clearly as possible without any distractions.

Here's where your sheet of white paper comes in. I find you can fit most things on a sheet of A3 paper. If you don't have A3, use two overlapping sheets of A4; and don't worry about the join, we'll deal with easy removal of backgrounds a little later. If you don't have white, any bright colour will do and some items, such as jewellery, look better on black.

Most small items, such as the contents of your pockets, can be scanned rather than photographed

Lighting

The next thing to consider is lighting. I very rarely use a flash because a single camera-mounted flash unit produces very harsh directional lighting with hard shadows. If you have to use a flash, a plastic diffuser or a piece of tracing paper over the front can soften the lighting a little – or, if the head angle can be adjusted, or you can remove it from the camera, bounce it off the ceiling or a wall.

I find that ordinary daylight provides much better results though. So prop your object on its paper close to a large window, or venture outdoors. Bright, cloudy weather is better than full-on sunshine. If it's too bright use a net curtain or sheet as a diffuser (see 'Light tents' in the kit boxout on the opposite page). If one side of your object is in shadow, another piece of white paper or card can be positioned opposite the window to reflect light back.

Use a tripod

There can be a lot of fiddling about, getting the subject in the right place at the right angle and adjusting reflectors. Placing the camera on a tripod will make things a lot easier. Another thing that can be useful is Plasticine or Blu-Tack – use it to prop objects at an angle to make for more dynamic shots and to show more of an object to the camera.

Or a scanner

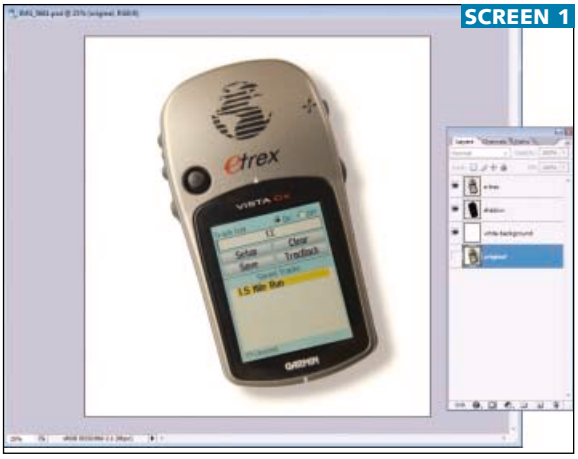
With some smaller objects you can save yourself the effort of worrying about lighting, backgrounds, angles and the rest by scanning them.

Books are an obvious candidate for scanning, but jewellery, coins and medals, mobiles, handhelds and other small gadgets all scan well. As long as the object to be scanned is no bigger than the scanner and no deeper than an inch, you should get good results. A scanner has surprisingly good depth of field and even detail that's a few millimetres above the glass will be in reasonably sharp focus.

A scanner already has a plain white backdrop, though for some things, in particular light and reflective objects, you might want to place a sheet of black paper behind the object.

Computer screens

If you want to sell your notebook PC on Ebay, you'll need at least one good



Add a drop shadow to a cut-out image to give it depth

photo to show exactly what bidders are getting and what kind of condition it's in. LCD screens don't reproduce all that well in photos, so you have two options – either show your notebook with the screen switched off, which looks dull, or paste in a screengrab. If you do this you should mention that the screen image is simulated. You could always include a smaller photo showing the actual screen to prove your machine is in working order.

If it's not possible to take a screengrab, for example with handheld devices, try and arrange the lighting so that it doesn't fall directly on the screen and attempt to match ambient light levels to the screen brightness so that your exposure setting will capture both the screen detail and the device. If that's not possible make two exposures – one for the screen and one for the device – and cut and paste.

Ethical issues

Manipulating photos to improve the way they look raises some ethical and legal issues that you should be aware of. If you're simply removing distracting background detail, or making tonal adjustments to improve image detail, that's not a problem.

However, if you use retouching tools to, for example, remove scratches and other damage from an item, the buyer could legitimately complain that you misrepresented their condition. By restricting your photo manipulation to image enhancement and mentioning any retouching that could be misinterpreted, you can avoid such problems.

Digital manipulation

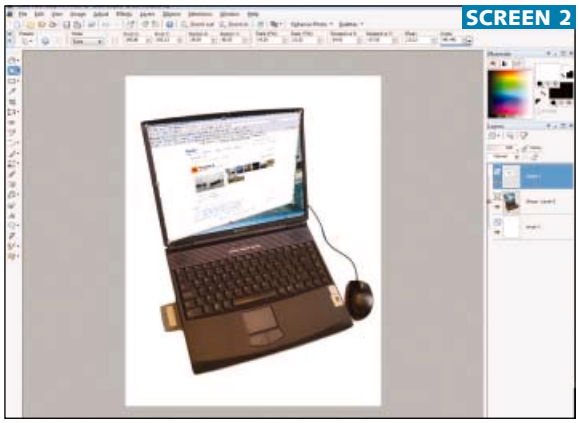
One of the simplest ways to improve a product shot is to cut out the background. Make it easy for yourself by photographing the object on the plainest background you can find. It doesn't have to be white or flawless – as long as it's relatively plain it will make the job of selecting it with a magic wand or colour selection tool much easier.

The key to getting the job done quickly is to select the background, rather than the object. Unless the background is very plain, set your magic wand or other selection tool to a lowish tolerance and Shift-click to select the background in clumps. While it can be satisfying, there are no prizes for getting it all in one go. If your editing application has a colour selection tool this might yield better results than a magic wand tool.

With the background removed, objects can look a bit stark on plain white. To add a natural-looking drop shadow duplicate the cut-out object layer and use a levels adjustment to make it black – drag the slider on the left side of the histogram as far to the right as necessary. Apply a Gaussian blur filter to the layer to soften the edges. The Radius amount will depend on the image size, but for a high-resolution image somewhere between 20 and 40 should work well. If your shadow layer is in front of the object you will, of course, need to drag it behind and offset it a short distance – try to position the shadow where it would fall naturally, given the lighting conditions (see screen 1).

Finally, reduce the layer opacity to around 30 or 40 per cent to make the shadow grey. For added realism add a small amount of noise.

Replace a screen in Corel Paint Shop Pro Photo X2



Replacing screens

The first step to producing a good screen image on a monitor or notebook photo is to do a screengrab. Press the Prt Scr button on your keyboard, or use a screen capture utility such as the free Irfanview (**www.irfanview.com**).

Launch your photo-editing application – I'll describe how to do it in Paint Shop Pro Photo X2, but any program with a distort or perspective tool will do. Paste the screengrab into a new layer above the original image and select the Pick tool.

Grab a corner handle and, holding down the Shift key, drag it to one corner of the screen. Shift-drag the remaining three corner handles to the other three corners of the screen and you're done (see screen 2). **PCW**

Kit for taking it to the next level

Ring flash

As we've seen, you can take perfectly good product shots with the most basic equipment. But if you need a lot of product shots, for example for a catalogue, then there are some bits of photo gear that can make life a lot easier.

A ring flash is a special flash unit designed for macro photography. The flash element surrounds the lens like a ring, hence the name.

The light source hits the subject straight on, so shadows are virtually eliminated, though you do get a very light shadow-halo effect around the subject. Short Images makes a ring flash adapter to fit Canon Speedlight 580EX and Nikon SB-800 flashes – see **www.flaghead.co.uk/pages/ringflash-range.html**.

Light tents

If you don't have a studio with big diffuse artificial lighting, a light tent provides an inexpensive alternative that can be used with either natural daylight or artificial light.

Light tents are really little more than a sheet – they let the light pass through, but diffuse it to provide soft shadowless lighting.

Some light tents form a cube when assembled so that you can easily place the product inside. Light tents aren't all that expensive and if you do a lot of product photography it'll soon pay for itself.

If you can't justify the cost it's not difficult to make your own and there are lots of tutorials on the web – just search for 'DIY light tent' in your preferred search engine.

Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Word processing column.
Email wp@pcw.co.uk
Please do not send unsolicited file attachments.

Building with Word 2003

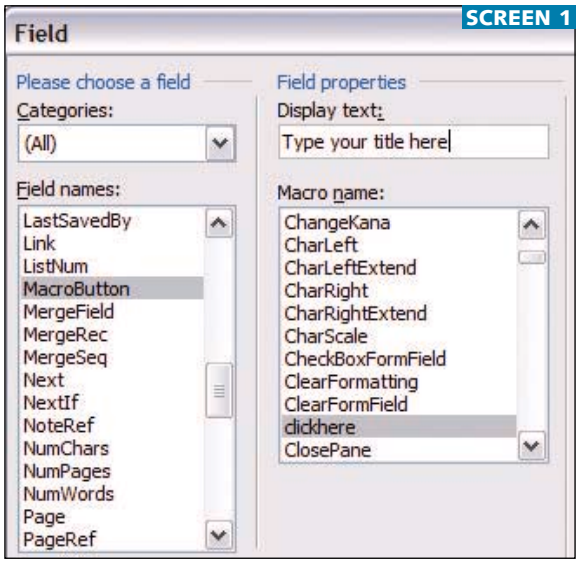
Remove private information and add some Word 2007 tricks to the 2003 version

In the March column we looked at Autotext in Word 2003 and earlier, and in April we covered Word 2007's Building Blocks. Last month we looked at some of the Content Controls and 'Click Here' blocks you can use in Word 2007. This month we're going back to the less glamorous world of 2003 to see how you can use similar automation features.

As with many of Word 2007's new features, there's a lot of emphasis on presentation. Whereas the Galleries provide a quick way of adding all kinds of content, many of the features are there in earlier versions. Starting with the 'Click Here' boxes, there's a quick way of doing this. First, you need to create a macro. Go to Tools, Macro, Macros, type in a name (let's say, 'Clickhere') and click the Create button. The VBA editing window will appear with the head and tail of 'Sub Clickhere()' plus a few lines of comment. This is all you need, so close the VBA editor. Now, in the document, choose Insert, Field, MacroButton and select your Clickhere macro from the list (see screen 1). In the 'Display text' box above the macro list, type in the prompt; eg, 'Type your title here'.

OK to insert the field, then format it as you want, making sure you have the field results rather than code visible – right-click to toggle between the two. Save this in a template; you'll find that all new documents based on the template will display the prompt. One click will select the entire prompt, and typing the real title will replace it.

For a more sophisticated and versatile method of adding 'ready-to-go' content to a template, you can use forms. Forms and their controls aren't really as scary as they sound. It's a bad choice of word – most of us associate forms with tax returns. So brace yourself, create a new template and turn on the Forms toolbar.



A quick-and-dirty 'Click Here' block

Starting with the simplest, the left-most button inserts a Text form field. This defaults to a four-character blank space – it helps if you turn on shading (eighth button from left). Right-click on this and select Properties, or select the field and press the Options button (fourth from the left in the Forms toolbar) and you'll get the dialogue shown in screen 2. The default is Regular Text and you can type the placeholder text in the box beside this.

Below this you can set a limit for the length and specify the case – upper, lower, first capital or title case. Below that you can specify macros to run when the user enters or exits the control – we'll return to this another time. Make sure, however, that the 'Fill-in enabled' box is checked.

Numeric characters

As well as regular text, you can also restrict input to numbers, dates or calculations. For the first of these any non-numeric characters will be discarded when leaving the field; once again, you can impose a maximum (but unfortunately no minimum or exact) length. With dates, you don't, alas, get a 2007-style calendar gadget, but you can enforce a date format.

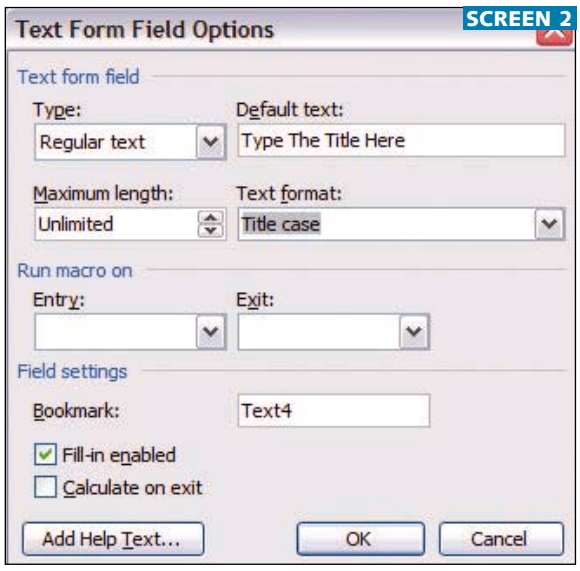
The next item on the toolbar is a check box, which is self-explanatory, but again can be wrapped up with macros to achieve further automation.

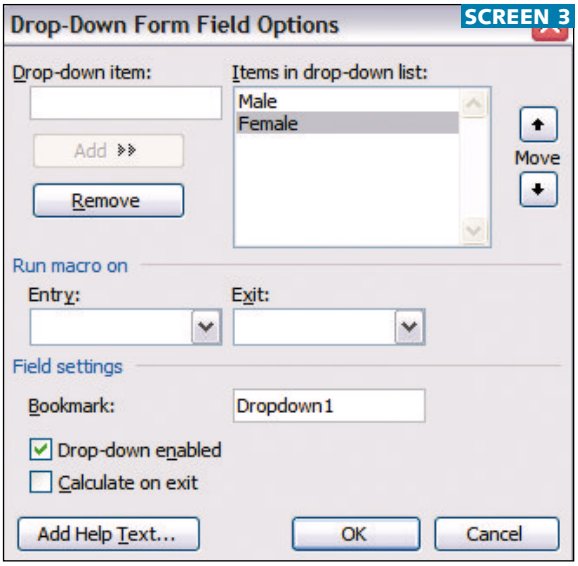
There may be times when you want to restrict user input to a list of items, rather than let them enter free text. For example, if you have a field for 'Sex:' you'll generally want people to enter 'male' or 'female', but there's always the office wag who will want to put 'yes please'. A good way to avoid this is with a dropdown list. Click on the third button, then the Options button, and you'll be able to add items to the list (see screen 3).

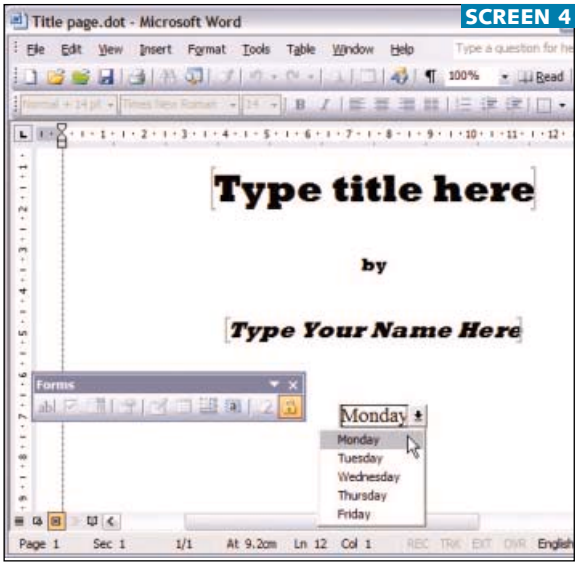
If you've got this far, you will have noticed that nothing works. You need to protect the form so click the padlock button. This locks the form fields, and they will function as they would for the user (see screen 4). You'll need to click again to return to editing mode.

Later versions of Word have a useful Reset button to return everything to the default values after

Form control options are not nearly as daunting as you might think







This is what the finished product looks like

experimentation. You can also add Help text to any item – either in the Status bar or in its own independent F1 pop-up.

When you've got your template perfected, you need to protect it permanently so that users can't change the controls. First, insert a section break after your last form field. Next, go to Tools, Protect Document, and, in the Task Pane that appears, select 'Filling in Forms' in the 'Editing Restrictions' section, then click the 'Select Sections' link below. Select just the first section, otherwise users won't be able to add any new content to the document. Having done this, click the 'Start Enforcing Protection' button. This will produce a password request. Finally, save the template. The restrictions you applied to the template will be applied to any new document based upon it.

Dropdown lists limit choice

Paranoia corner

When you installed Word, you would have been prompted for your name, initials and mailing address. This information, which in Word 2003 and earlier is found under Tools, Options, User Information, can appear in the Document Properties, so third parties can tell, for example, the author of any document. This may or may not be desirable, but it's just the tip of the iceberg of invisible metadata that can be included in a file, such as hidden text, comments, the template name, the computer or server name and more. And if you have fast saves enabled, then even text you thought you had deleted may be available to the curious with a text or hex editor.

Word 2007 doesn't offer Fast Saves and has a tool to deal with the rest. Go to the Office menu, Prepare, Inspect Document. This will search for various metadata elements, such as comments, personal info and hidden text, and optionally remove them (see screen 5).

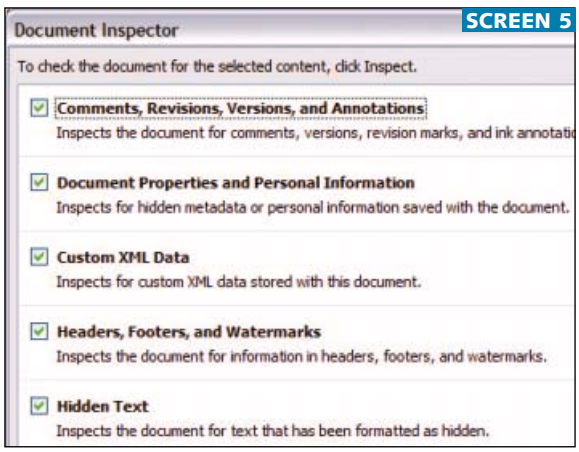
In Word 2003, you can go to Tools, Options, Save and check the 'Remove personal information…' box. But this doesn't do any more than it says – comments and hidden text will still be present, as will any custom properties that derive from the template. If you just want to remain anonymous by default, you can remove your name from User Information, but that doesn't do any other cleansing.

Urge to purge

Here's a five-point plan for purging Word 2003 and earlier of potentially compromising data.

- Versions – Word 2003 and earlier allow you to combine multiple versions of a document in the same file. To get rid of previous versions, go to File, Versions and delete these. Make sure the 'Automatically save a version…' box is unchecked.
- Fast saves – just say no. We explained last month how these may leave deleted text in a file. Turn this off from Tools, Options, Save.
- Hidden text – first you need to make all hidden text visible. Go to Tools, Options, View and check the Hidden Text box in the 'Non-printing Characters' or 'Formatting Marks' section. Go to the beginning of the document, then Edit, Replace. Click the More button, then Format, then Font. Tick Hidden in Effects, then OK back to the Find dialogue. You don't need to type anything into the 'Find What' or 'Replace With' boxes, just click Find Next, then Replace to delete it. If you are sure you don't want to recover hidden text, then Replace All.
- Document properties – go to File, Properties. Turn to the Summary tab, then highlight and delete the contents of any fields you don't want available. Repeat the process for the Custom tab.
- Revision marks and comments – go to View, Toolbars, Reviewing. In the Reviewing toolbar, make sure the Track Changes button is off. Now use the Next and Previous buttons to go to each previously tracked change, then either Accept or Reject it.

2007 weeds out compromising metadata



Reader's tip

In my reply to Geoff Fisher in April's Question Time I stated that you can't have a 'Close' button on a single document in Word 2007 without turning off 'Show all windows in the Taskbar' from Word Options. "Oh yes you can," states Joe Wilson. Go to Word Options, Customise. In the 'Choose commands from' box, select 'Office Menu'. You'll be able to add the 'Close' command to the Quick Access Toolbar. Good thinking, Joe. **PCW**

Stephen Wells is a freelance journalist and a regular contributor to computer magazines. He's been writing PCW's Spreadsheets column for over 10 years.

→ Comments welcome on the Spreadsheets column.
Email spreadsheets@pcw.co.uk
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What's your status?

The Status Bar along the bottom of the Excel screen has got better

The whole idea of the Status Bar at the bottom of the Excel screen has always been to keep you informed of where you are. To display it, choose Status Bar on the View menu. At the left it usually says Ready. If you start entering anything in a cell it will say Enter. If you click in the Formula Bar, or click in a cell and press F2, it will read Edit. Beyond that, Excel 4 only gave you up to seven messages. They are still extant.

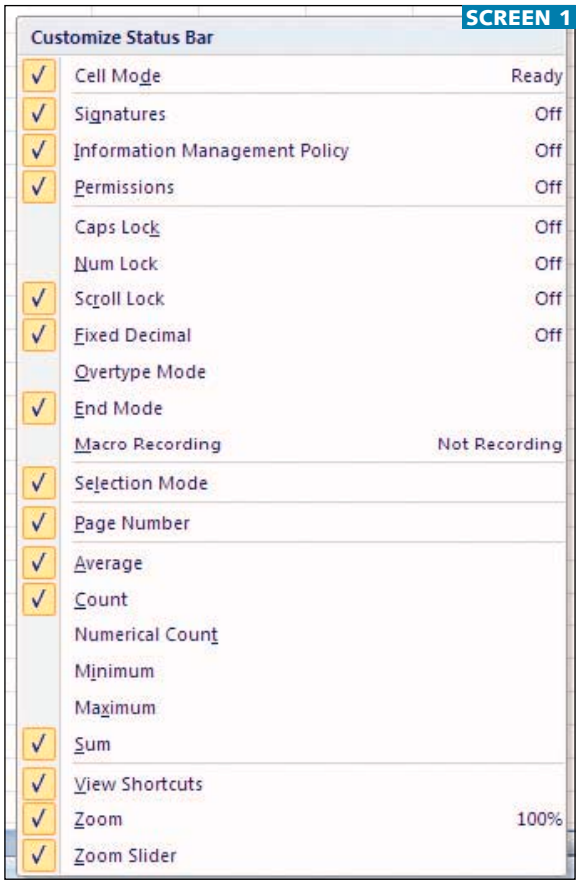
There is ADD. If you highlight a range of cells and want to add other ranges or single cells to that range for calculation purposes you can press Shift & F8 and the ranges of cells can be added. To close ADD mode you press Shift & F8 again. To accomplish the same thing most people today would just press Ctrl and click on the cells to be added.

EXT is a variation of this. Highlight a range, press F8, click on a cell away from the range and that cell will be added to the range. For example, if you click on cell B2 and press F8 you can then click on cell C10 and the range B2:C10 will be highlighted. Press F8 again to deselect it. Again this has fallen into disuse as most people would hold down Shift and click on cells B2 and C10 to do the same thing.

NUM tells you if the Number Lock key is on. If it is, the keypad keys on the right-hand side of a normal keyboard produce numbers. Press the Number Lock key once and those keys control movement. In this alternate mode, press 8 and the cell focus goes up. Press 2 and it goes down. By default these days the Number Lock key is usually on and people use the arrow keys or the mouse for moving around the worksheet.

FIX is very useful when you're entering money amounts in a hurry. To turn it on choose Tools, Options, Edit, Fixed Decimal. (In Excel 2007, Office, Excel Options, Advanced, Editing Options, Automatically insert a decimal point, OK). If you enter 12345 in a cell it will record and display 123.45.

SCREEN 1



All the options that Excel 2007 offers in the Status Bar

OVR board

OVR substitutes new entries for old. Click on a cell and press F2 to edit in a cell, or click in the Formula Bar to edit the cell there, then press the Insert key. When you enter anything it will replace the existing entry rather than add to it. Normal activity is resumed when the next cell is chosen, unlike in Word where you have to press Insert again to stop overtyping.

SCRL just indicates when the Scroll Lock key has been pressed. If you press an arrow key the focus is fixed to a cell while the screen scrolls. Press the Scroll Lock key again and normal service is resumed. The worksheet remains still and the focus moves to the next cell.

CAPS simply indicates when the Caps Lock key is on. If you type smith when the Caps Lock key has been pressed Excel will record and display SMITH.

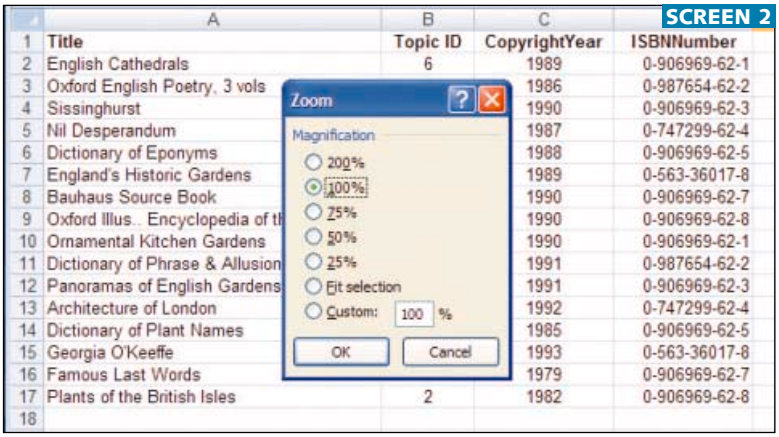
Enhanced status

The next major addition to the Status Bar was made with the introduction of Auto Calculate in Excel 2000. This gives you an instant mini calculator. Highlight a range of numbers, or a range plus other cells, and by default the total of them will appear in the Status Bar. If you right-click on the Status Bar, you can change Sum to Average, Count, Count Numbers, Maximum, Minimum or None. Count will count the number of all the cells with values. Count Numbers ignores cells with text.

In Excel 2007, Microsoft has really gone to town with the Status Bar. You can now right-click on it and have a choice of 22 items (see screen 1). If an item is checked on the left-hand side of the dialogue box it means it will be displayed in the Status Bar. On the right-hand side the box indicates whether the item is active or not. For instance, if the Caps Lock is on it will say On in this dialogue box. If it isn't it will say Off for this item.

All the enigmatic abbreviations are gone. The Status Bar now spells them out. EXT is replaced with Selection Mode or Extend Selection. FIX is Fixed Decimal. OVR becomes Overtype. SCRL is now Scroll Lock. CAPS is Caps Lock. It's much clearer.

SCREEN 2



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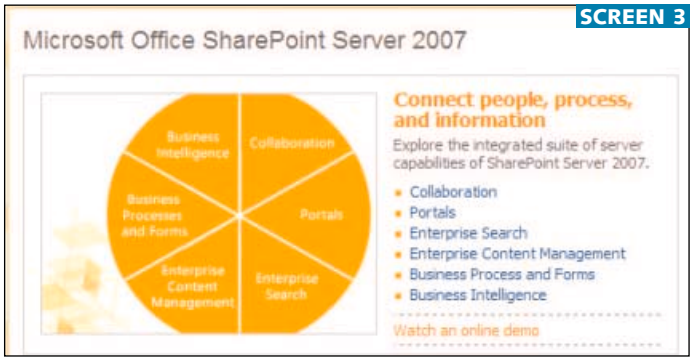
1	Title	Topic ID	CopyrightYear	ISBNNumber
2	English Cathedrals	6	1989	0-906969-62-1
3	Oxford English Poetry, 3 vols		1986	0-987654-62-2
4	Sissinghurst		1990	0-906969-62-3
5	Nil Desperandum		1987	0-747299-62-4
6	Dictionary of Eponyms		1988	0-906969-62-5
7	England's Historic Gardens		1989	0-563-36017-8
8	Bauhaus Source Book		1990	0-906969-62-7
9	Oxford Illus.. Encyclopedia of t		1990	0-906969-62-8
10	Ornamental Kitchen Gardens		1990	0-906969-62-1
11	Dictionary of Phrase & Allusion		1991	0-987654-62-2
12	Panoramas of English Gardens		1991	0-906969-62-3
13	Architecture of London		1992	0-747299-62-4
14	Dictionary of Plant Names		1985	0-906969-62-5
15	Georgia O'Keeffe		1993	0-563-36017-8
16	Famous Last Words		1979	0-906969-62-7
17	Plants of the British Isles	2	1982	0-906969-62-8
18				

The Zoom box in Excel lets you enlarge a range

SCREEN 3



Office Sharepoint Server lets you share Excel workbooks online

Auto Calculate has been upgraded, too. If you highlight a range of values, Excel 2007 can give you the Sum, Average and Count all side by side on the Status Bar.

Beyond the seven items previously detailed, and six of the seven items in Auto Calculate (the item None not being needed now) there are a number of new items. If you don't want the left-hand messages Read, Edit or Enter to appear, you can remove the check mark beside Cell Mode. End Mode indicates if you have pressed a keyboard shortcut starting with the End key. End & Up Arrow, for instance, takes you to the top of the current column.

Evolution of Record Macro

In earlier versions, Record Macro is a tool you can add to the Standard toolbar to start recording a macro. It shows a large round dot initially. Click on it to start recording keystrokes and the button becomes a square to indicate it is now the Stop Recording button. In Excel 2007, Macro Recording is now an option on the Status Bar.

Selection Mode is the new name for ADD and works the same way. It still adds cells to a range if you press Shift & F8.

Page Number shows the current page number and the total number of pages of a multipage worksheet, though it only appears in Page Layout and Page Break views. Click on where it says '100%' and the Zoom dialogue box appears, offering various percentages or a box where you can enter a precise percentage (see screen 2). It only duplicates the Zoom box that already appears under the View tab, and the Zoom tool that many people have on the Formatting toolbar in earlier versions of Excel. In either Zoom box you can enter 39% and borders will appear around Named ranges and their names will be displayed.

The Zoom Slider lets you zoom in to 400 per cent and out to 10 per cent by dragging it left or right with the mouse. It will also display the current Zoom percentage. In addition, if you highlight a range, and your screen is full, you can enlarge that range within the worksheet.

The three remaining options – Signatures, Information Management Policy and Permissions, provide information about the rights and restrictions of the current file. They only apply if you are using Office Sharepoint Server to share spreadsheets among groups of users (see screen 3).

Sharepoint server is built in to Microsoft's Windows 2003 Server operating system. It lets you build websites where people can share Excel workbooks, discuss them and collaborate on them. For the largest organisations there is the more expensive Office Sharepoint 2007. It includes an advanced set of features called Excel Services. But I only mention this to explain the items on the Status Bar. To learn more about Office Sharepoint Server, go to **http://office.microsoft.com/en-gb/sharepointserver/FX100492001033.aspx**.

Status symbol

In addition to all these items, you can add your own choice of message in the Excel Status Bar with a short macro. Press Alt & F11. Double-click on This Workbook in VBA Project Explorer and enter:

```
Sub StatusBar()
Application.StatusBar=" ↙
Substitute your message here"
End Sub
```

(Key: ↙ code string continues)

Press Alt & F11 to return to a worksheet. Press Alt & F8. Click Options and create a keyboard shortcut such as Shift & Ctrl & S. Run the macro with the shortcut. **PCW**

Counting letters

If you have a group of grade letters A to F in the range A1:A30, in cell B1 enter:

```
=CHAR(MODE(CODE(A1:A30)))
```

The most common grade will be displayed.

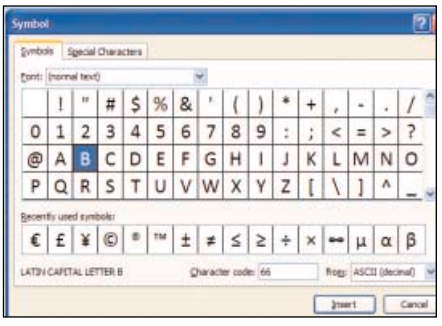
It works like this. MODE returns the most frequently recurring value in the range. As this function needs numbers to work with and not letters CODE is used to provide the numeric code for the letters in this range.

CHAR translates the number back again so it can be displayed in cell B1.

If you are using Windows, CHAR and CODE will use characters and their numbers from the Ansi (American National Standards Institute) set.

`CHAR(97)` is a lower case 'a'.

`CHAR(66)` is a capital 'B'. `CODE("M")` returns the number 77. To find these numbers, click Symbol on the Insert menu (or Ribbon tab in Excel 2007). Under Font, choose Normal text. In the From box, choose Ascii (decimal).



Refer to the Symbols box for Ansi code numbers

Niall Magennis has been dabbling in Midi and digital audio since the days of the Atari ST. He writes for a number of music magazines and lives in London in a flat overrun with music equipment.

→ **Comments welcome on the Sound column. It returns in the August issue.** Email sound@pcw.co.uk *Please do not send unsolicited file attachments.*

Create your own ringtones

It's easy to convert songs into ringtones using just a few simple tools

Not that long ago mobile phones rang out with monophonic renditions of well-known tunes that often sounded worse than a bunch of cats being strangled. Thankfully those days are gone and most phones can play digital recordings of real music.

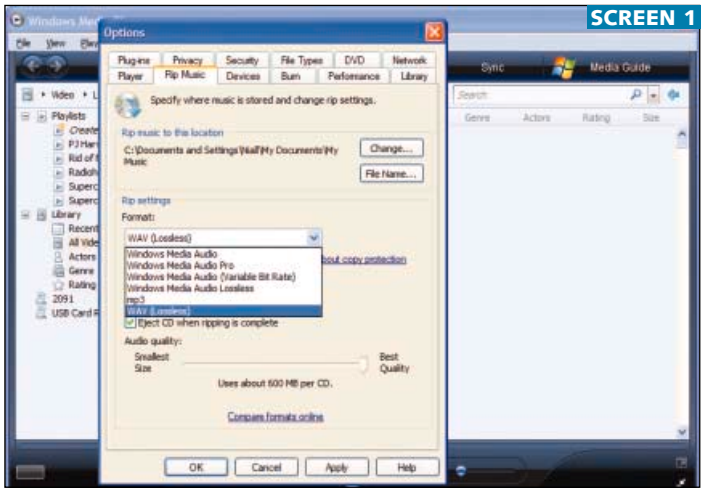
Although this means you now hear some dodgy ringtones, such as the samba ditty on your manager's phone, it has stopped the problem of everyone simultaneously reaching into their pocket each time the Nokia Tune begins to play.

Of course, now that phones can play proper music there are now more companies than ever trying to sell you new ringtones at exorbitant prices. Usually these new ringtones are branded as Trutones or Realtones, and sometimes it can be more expensive to have a ringtone sent to your phone than it is to buy and download a full track to your PC, which is a pretty ridiculous situation. Worse still, if you buy a new phone the ring tone that you bought for your old one may not be transferable to it, or may not be compatible with your more up-to-date handset.

Music companies aren't all that bothered about compatibility issues as each time we buy a new ringtone royalties from the sale are filtered back to them to fill their coffers. However, it doesn't have to be this way. With a little effort and the right tools you can quickly use your PC to convert existing music on CD or MP3 into a ringtone that you can then transfer to your phone. Be aware, however, that copying copyright-protected music is illegal if you don't have permission.

What you'll need

To get started you'll need to get your hands on some editing software that can be used to trim your audio file to a suitable length and then save it as an MP3 file. One of the best tools for this type of job is a program called Audacity. It's a free, open-source audio editor that can be downloaded from **http://audacity.sourceforge.net**. To allow Audacity to save your file in the MP3 format you'll also need the Lame MP3 codec. You can download this via **http://audacity.sourceforge.net/help/faq?s=install&item=lame-mp3**.



Make sure you set Windows Media Player 11 to rip in WAV Lossless format

Next you need some audio that you can turn into a ringtone. You can use either an MP3 file that you already have on your PC or rip a track from an audio CD. If you want to rip a track you can use Windows Media Player 11 for this purpose. Open Windows Media Player and click Tools, Options and then Rip Music. Choose WAV (Lossless) in the dropdown Format box under Rip Settings (see screen 1).

Unfortunately earlier versions of WMP can't be used to rip your file from CD because they don't support ripping to WAV format. However, you can always use iTunes instead. Just make sure you set the ripping option to WAV in the Advanced section of the Preferences menu.

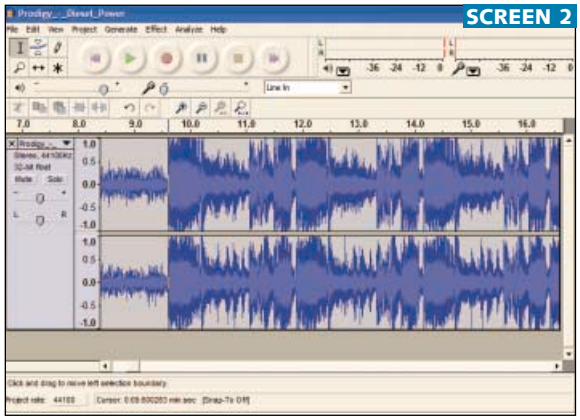
Now you've got your audio file ready it's time to load up Audacity. Once it has started, click on the File Menu and select Open. Choose your WAV or MP3 file and click OK.

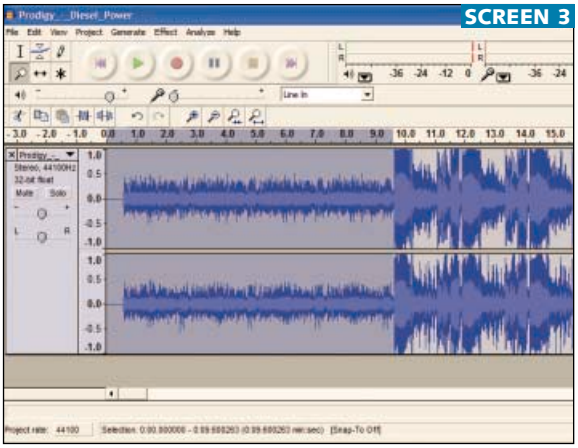
You'll now see the waveform for the audio file laid out in front of you running from left to right across the screen. Click on the Play button or hit the space bar to start listening to the track. You can quickly move to anywhere in the track by clicking on a location in the waveform and then double-tapping your space bar. To zoom in and out of the file select the Magnifying Glass icon and then click the left mouse button to zoom in and the right mouse button to zoom back out again. To return to editing mode select the icon that looks like a capital 'I'.

Top and tail

For a ringtone, you'll usually want to use a phrase from a tune rather than the whole song, so scan the music for a suitable section that you can cut out of the main track. You're looking for a section that's around 30 seconds long.

The peak in the jagged line around the cursor represents the first drum hit in the bar





When you've found the part you want to use the next step is to trim it to the required length. Rather than having a ringtone that comes to an abrupt stop you want it to naturally reach the end of a bar or section and then stop neatly. Usually you can spot the bass and snare drum hits in a piece of music because the wave form tends to peak around these areas and then trail out after them to form a sort of jagged horizontal triangular shape

Here we're trimming down the file to make it more suited to a short ringtone

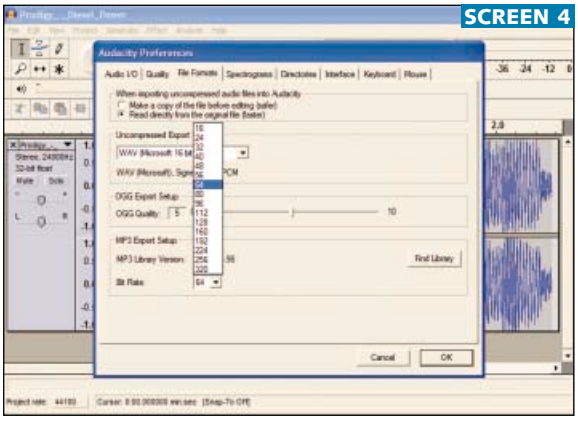
'You now hear some dodgy ringtones, such as the samba ditty on your manager's phone'

(see screen 2). To trim the start of your ringtone look for the first drum hit in the music. Now click and highlight the area of the wave form just before it and then hit the Delete key (see screen 3). Press Play to audition the change you've made. If you've trimmed too much off the start of the audio press Ctrl & Z to undo the edit you've just made and try again.

Once you've got the start of your audio trimmed you need to do the same with the end of the file. Try to trim the audio just before the first bass drum kick at the start of a new phrase or bar. This way the start and end of your ringtone should match up. If you hold down the Shift key before hitting the Play button, Audacity will switch to loop mode so you can more easily audition your file and check whether the start and end form a perfect loop.

When you're happy with the edits you've made the final step is to export the audio to a new MP3 file. The built-in speaker or speakers on most phones respond to a relatively low range of frequencies so we can get away with reducing the bit rate of the tone without affecting its perceived audio quality too much. Reducing the bit rate also has the benefit of reducing the space needed to store it, leaving you with more room to store pictures and music tracks.

Reducing the bit rate to 64Kbits/sec will save on storage space



By default Audacity exports MP3s at a bit rate of 128Kbits/sec, but we need to change this to 64Kbits/sec. Click on the Edit menu, Select Preferences and then click on the File Formats tab. At the bottom of this window there's a dropdown box marked Bit Rate. Click on this, select 64 and then click on the OK button (see screen 4).

Now to export the tone click on the File menu, select Export As MP3, enter a file name and then click Save. Audacity will ask you to fill in the Artist and Song Title information for the file's ID3 tags and then your file will be saved to disk.

You can now send the file to your phone via Bluetooth or USB, or simply by copying it to a memory card and slotting it into your phone. **PCW**

Transfer ringtones to another handset

If you already own a ringtone that you'd like to use on a different handset you may be able to transfer the file from one phone to another. If the two phones you are using are reasonably modern then the easiest way of doing this is to use a wireless Bluetooth connection.

For example, if you want to send a file from a Sony Ericsson handset you first enter the phone's main menu and then select the File Manager icon. Next choose Music and enter the Ringtones folder. On Sony Ericsson phones the ringtones format should be obvious from the icon next to it. For example, MP3 tones are shown by a musical note icon with the letters MP3 printed next to it. Similarly M4A files have a music note icon with M4A printed on it. As MP3 files have no Digital Rights Management embedded in the file, you should have no problems transferring an MP3 tone from one phone to another.

To start transferring the file, first select it in the list and then press the More softkey. Choose Send from the pop-up menu and then select Via Bluetooth. As long as Bluetooth is activated on both phones the Bluetooth name of the receiving handset should now appear on the screen. Highlight the phone's name and choose Select. You may be asked whether you want to accept the transfer of the file on the other handset. If so, just select yes. The file will then be sent to your new phone. Most phones will automatically store the transferred file in their ringtone folder, but you'll probably have to enter this folder and manually set the new tone to act as your default.

If your phone doesn't have Bluetooth then you may be able to transfer the file in a similar way using infra-red. If neither handset has infra-red then you may be able to save the file to your phone's memory card and transfer the card into your new phone. Another method that might work is to connect your phone to your PC and then use the relevant software for each handset to download the tone from the old handset and upload it to the new one.

Bluetooth makes it easy to wirelessly transfer ring tones between handsets

Alan Stevens has implemented and supported networks for over 25 years, working for IT vendors, system integrators and customers. He now mostly researches and writes about networking matters.

→ Comments welcome on the Networks column.
Email networks@pcw.co.uk
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Crack Homeplug encryption

A guide to encrypting Powerline networks, and more about Vista's first Service Pack

In this Network Hands On, I'd like to revisit the question I tried to address in my last column – "If Powerline/Homeplug devices can communicate across circuits, will devices in the next house or office, or even down the street, be able to connect to mine?"

I've always been sceptical that this might be possible and ran a few tests with a neighbour to check, but it seems I didn't quite appreciate how AC power is distributed in the UK and didn't do as much testing as necessary. Several of you wrote in pointing out where I went wrong, but I'm most grateful to David Mowbray of Sheffield University who sent the following.

"I read with interest your article concerning Powerline networks in the March edition of *PCW*. However, the issue of security and your test of a possible connection to a next door house has additional complications.

"The power cables running down a street contain three separate supplies, referred to as the three phases. While all three of these phases will be fed into large buildings, as this allows powerful equipment to be driven, only one of these phases will be fed into an individual house. Hence along the street one-third of the houses will be connected to one phase, one-third to another and so on. If two houses are connected to different phases then no connection will be possible between Powerline networks in these houses.

"Although a third of houses will be connected to a given phase, the connections are made at random, so two adjacent houses could be on the same phase but only with a one-third probability.

"Hence to fully test the security of this system you need to try to establish a connection first with the house next door, then the next one down the street and so on. You should also test two houses on the other side of the road.

"As you say, encryption should be turned on, so the above is less of an issue but could be important if you were deliberately trying to establish a network between neighbouring houses. Also it is possible that in some large buildings different parts of the building may draw their power from different phases."

I'll leave the issue for now and simply reiterate that it's unlikely to be an issue for most domestic users, and agree with David that if you're worried then you should make full use of the encryption offered to scramble and thus protect your data.

A button on the front of the Solwise NET-PL-200AV Push adapter makes it easy to configure encryption and protect a Homeplug network

Practical encryption

Most of the Powerline/Homeplug devices I've tried have fallen into one of two categories: those that use software to set up and manage encryption, and those that do it all in the hardware. Of the two, the latter are still in the minority but are the easiest to configure, as with Solwise NET-PL-200AV Push adapter, which was reviewed in the January issue.

The Solwise Push adapter is a £50 ex Vat 200Mbits/sec Homeplug device. Encryption can be configured using software if you want, but there is also a button that can set it for you. Referred to by the developers as Simple Connect, this tells the adapter to find others on the network then decide on a randomly generated, 128-bit AES key, also called the private network name, to scramble data.

The process is very quick and easy. If you have two adapters, simply push the button on one then, within two minutes, do the same on the other.

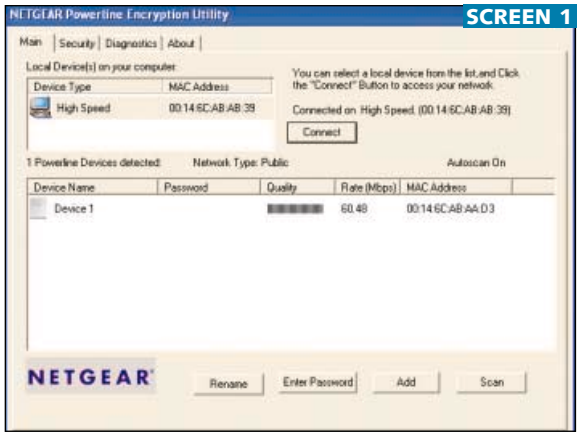
In a situation where you're adding a third, fourth or other adapter, push the button on one of the existing devices then, again within two minutes, do the same on the new one. The key will be generated, shared and the devices connected to form a secure, encrypted Lan.

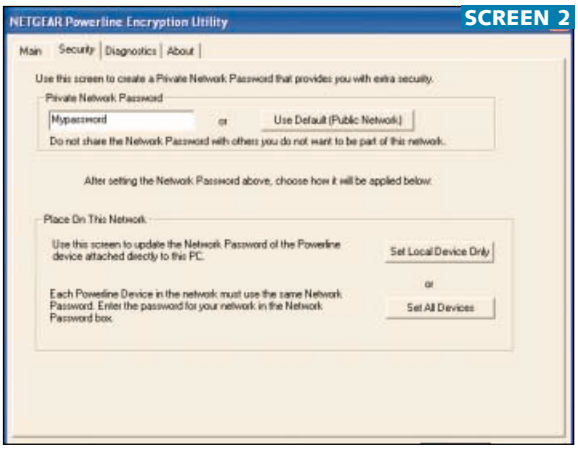
On the downside, if you use the Simple Connect option you can't mix Solwise Push adapters with those from other vendors. That's principally because you don't know what key is being used. Opt for the software approach and interoperability is achievable, but the hardware method simplifies the process and most home users will stick with one vendor anyway, so it's not such a big issue.

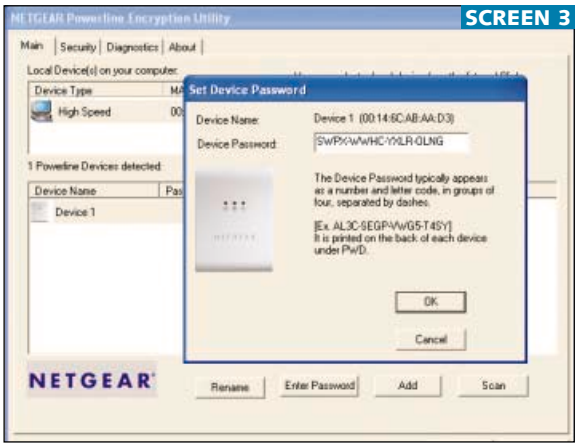
The software method

Other vendors, such as Devolo (**www.devolo.com**), also sell adapters with a button to set up encryption, but

This Windows utility has discovered two Netgear Homeplug devices, one local and one connected via the mains wiring







To stop unauthorised changes to the key on remote Netgear adapters you have to first supply a hardware password found on a printed label on each device

most still rely on software to configure the option. Exactly what's involved here can vary, although most vendors ship an implementation of the same utility and, for my examples here, I've used the one that came with a couple of 85Mbits/sec Netgear devices (Netgear XE104 wall-plug switches) which I use on my network.

The Netgear utility can be installed on any PC running Windows 2000 or later, including Vista, the only major requisite being a network connection.

When it first starts up you'll see a display like that in screen 1, showing the local Powerline devices on the Lan to which the host PC is attached with, underneath, a second list of those found connected via the AC mains supply. In the screenshot just two devices have been found. A local adapter which has a MAC address ending AB:39, and one remotely connected via the mains wiring (referred to as 'Device 1') which has an address ending AA:D3.

Encryption is enabled already although this isn't immediately obvious. That's because when taken out of the box and first plugged in the Netgear adapters find each other and create a public network using a key (Netgear calls it the private network password) of 'Homeplug' to encrypt the data. Any new Netgear adapter will also be set to use this key so can be added to the network without having to be configured, as will most devices from other vendors, so it's a good idea to change the key used.

There are two ways of going about this, one of which is to plug all the adapters you want to set up into the same Lan. You can then change their passwords individually or all together, using the encryption utility provided (see screen 2). Because the adapters are all on the same local network this can be done without providing any additional security information, the software assuming that you 'own' all the adapters involved.

The default encryption key, or Private Network Password, can be changed individually or on all the adapters on the network

That assumption can't, however, be made if some of the adapters are connected over the mains, as anyone could then plug in an adapter and change the network password globally to gain access. So before you're allowed to change the password of a remote adapter you have first to type in a preset hardware password. This can be done from the main display (see screen 3) with, in the case of the Netgear adapters, the hardware password to be found printed on a label on each device.

Before I leave the issue of Powerline/Homeplug networking, at least for the time being, I want to clear up one other common mix-up regarding interoperability.

Two types of Homeplug adapter are available. First, those that conform to the original Homeplug 1.0 standard, generally marketed as capable of communicating at either 14 or 85Mbits/sec (turbo mode), and second-generation 200Mbits/sec products, such as the Solwise NET-PL-200AV Push adapter, mentioned above. The latter tend to be referred to as Homeplug AV products, although they can have other names and are generally advertised as suitable for streaming HDTV, Voice over IP and other bandwidth hungry traffic.

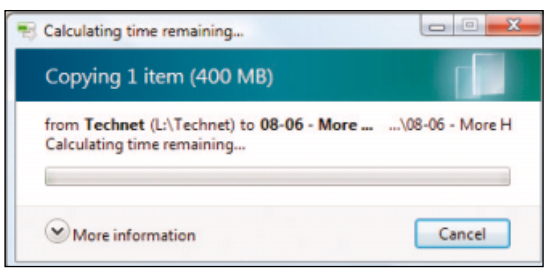
Homeplug 1.0 devices should all be able to talk to each other, whether rated at 14 or 85Mbits/sec. They can also co-exist alongside Homeplug AV adapters on the same mains wiring. However, Homeplug 1.0 and AV products can't communicate with each other, so either buy another Homeplug 1.0 device or replace what you have with an all-AV setup. **PCW**

A bit more about Vista file copying

Microsoft has finally released more information relating to file copy enhancements in the Vista SP1 update that I talked about last month. This confirms that you can expect big improvements in speed when the update has been applied, especially when copying to and from other Vista or Windows Server 2008 systems.

Unfortunately there are a couple of instances when SP1 can have an adverse effect. One is when copying to or from a Server 2003 system over a slow network, where changes made to address possible server caching issues can halve throughput compared to Vista RTM. The other is when making copies of large files on the same volume.

On the good news front, with SP1 applied Vista should be more responsive and Windows Explorer faster at coming up with an estimate of the time it will take to copy files. Those estimates should also be more accurate. So even if it takes longer you will at least be able to get on with something else or, failing that, know if you've time to make a coffee or not.



With SP1 applied Vista will be quicker and more accurate at estimating how long it will take to copy files

Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars.

→ **Comments welcome on the Databases column.**
Email database@pcw.co.uk
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Trawling engines

Just how does a database engine work? Plus a query about organising fishing data

A database engine is designed to store, manipulate and query data. That's it; nothing more; easy, really. The odd thing is that this simple and entirely accurate view is often not understood even by database professionals and, for reasons that will shortly become apparent, that can cause serious problems.

By far the most common type of database engine is the relational database engine (examples are DB2, Access, SQL Server, and Oracle). Relational engines store data in tables and allow us to organise the data according to a set of rules, producing so-called 'normalised' data. Essentially the rules say that each piece of data should be stored only once and that data about the same type of thing should be stored in the same table. For instance, data about birdspotting should be in one table and data about a book collection should be in another.

One of the advantages of normalised data is that you get certain guarantees about its behaviour when you query it. If you phrase the question correctly, you always get the right answer and all of the data can be queried in a predictable way that can be reproduced.

So what doesn't a database engine do? Database engines, whether relational or not, have nothing to say about how the data is presented to the user after the query has been run. They don't have any 'interest' in how it's presented on a form, in a report, on labels, or anywhere else. The database engine will fetch the data requested but that's all.

Access is something of an oddity in the database world in that, in addition to a database engine, it comes with a built-in form designer and a report generator. High-end client-server databases (SQL Server, DB2, Oracle) don't have tools for building forms or reports – you are expected to use a different piece of software for that, produced either by the same manufacturer or by a third party.

However, it still obeys the rule. Access' database engine (Jet) has no truck with layout, it just so happens that Access also includes some additional components (form and report tools) that clearly are concerned with layout and let you go some way to controlling layout. However, they don't always go far enough to solve everyone's problems. The report generator especially is not stunningly good, but saying so is rather like complaining that a dog doesn't sing very well: most database systems can't sing at all.

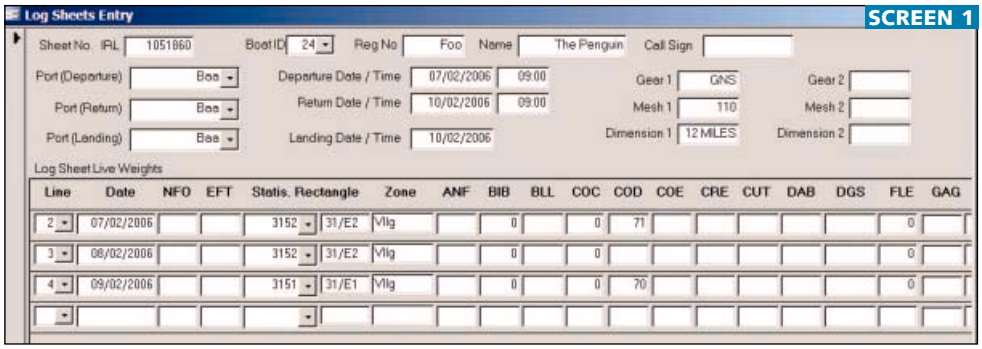
Sometimes the presentation of data is a major issue and one that it's not always easy to solve. Within the space of a few days I received two questions which on the face of it were very different but, in fact, both were questions about layout.

A question of address labels

The first question came from Rodney Bryant who runs an Access membership database, one category of which is a 'family membership' that covers the whole family including children. Rodney would like to create an address label that addresses the children independently, so that if Mr Smith has two children, Alice and Ben, he wants a label reading 'Alice and Ben Smith'.

The data is normalised so it is very easy to extract a list of names of all children covered by a family membership agreement. Each child's name will appear in a row in the answer table. To achieve a line on a label reading 'Alice and Ben Smith', we would have to take data from

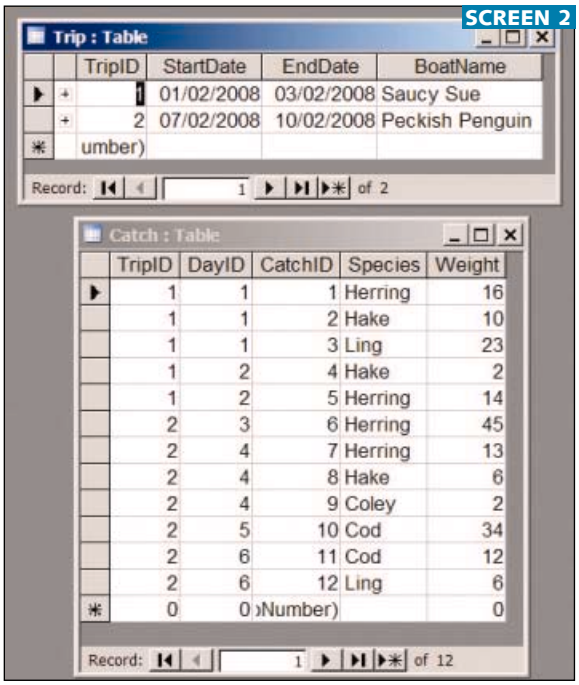
SCREEN 1

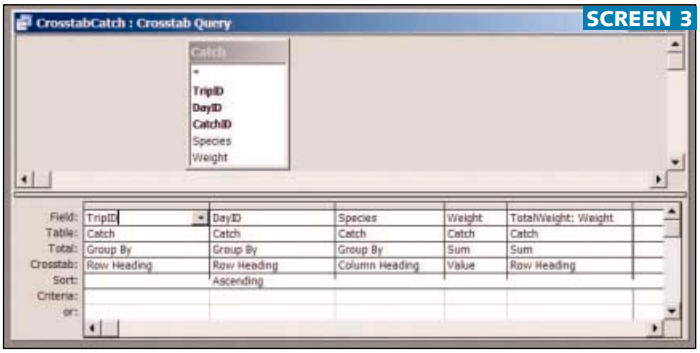


This form is full of zeros, which we want to eliminate

The normalised database has two tables

SCREEN 2





several separate rows and present it in a single row. That's a description of a presentation job, not a database job, which is why SQL has no direct way of doing it.

Indeed, if we try to solve this problem with SQL then we are using the wrong tool. The database engine is not designed to present data other than in the most basic form (as tables with rows and columns) and SQL doesn't have any constructions for presentation. This is the kind of task a reporting tool should undertake (and the one in Access might require you to delve down into Visual Basic to produce the desired result).

If your reporting tool won't do it, change your reporting tool. Don't change the database engine because doing so won't help.

Incidentally, I'm not saying that it is impossible to solve Rodney's problem using SQL – all manner of Byzantine constructions can be dreamed up to force it to do things for which it wasn't designed; Cartesian joins and make-table queries usually feature in them. But you'd still be using the wrong tool.

A question of fish

Fran Cobden has an Access 2000 database for storing fishing activity on sea trips and has normalised the data structure but has met a stumbling block when designing new forms. Fran wants to duplicate the look of the form from the old non-normalised regime, which used a form with an embedded sub-form (see screen 1).

The form shows all the details about a single trip; the sub-form had one row for each day of fishing activity on the trip, which showed the number of each species of fish caught. This was fine except that there are 45 species of fish, identified by three-letter codes, of which on average 10 are caught per trip, so the sub-form was always jam-packed full of nulls. In the new, normalised database Fran hoped to lose all of the nulls.

The normalised database has two tables (see screen 2) – one stores details about each trip (Trip) and one records the catch made on each day of fishing (Catch). This sample database has a much simplified version of the data.

Basing a form on the Trip table is so simple that we can use the wizard.

A crosstab query will produce the sub-form data

The data for the sub-form is also easy: we can use this crosstab query called CrosstabCatch (see screen 3):

```
TRANSFORM Sum(Catch.Weight) ↙
AS SumOfWeight
SELECT Catch.TripID, ↙
Catch.4DayID, Sum↙
(Catch.Weight) AS↙
TotalWeight
FROM Catch
GROUP BY Catch.TripID, ↙
Catch.DayID
ORDER BY Catch.DayID
PIVOT Catch.Species;
```

(Key: ↙ code string continues)

which produces an answer table looking like screen 4.

So, we've got the data. This is the point for Access users where the limitations of the user interface begin to bite.

The obvious approach is to embed the crosstab query as a sub-form on to a form, but Access won't allow that. It's possible to proceed by making the crosstab query a parameter query (remembering to specify the data type by going to Query on the main menu, Parameters). A button can then be placed on the form which runs the parameter/crosstab query. Click the button and you'll be prompted for the ID of the trip for which you want to see the records.

Type it in and the data is displayed. It's a kludgy solution and a work-around typical of the type constructed when the UI runs out of gas. You can also attack the problem with VB code.

The answer table produced by the crosstab query

SCREEN 4

CrosstabCatch : Crosstab Query

TripID	DayID	TotalWeight	Cod	Coley	Hake	Herring	Ling
1	1	49			10	16	23
1	2	16			2	14	
2	3	45				45	
2	4	21		2	6	13	
2	5	34	34				
2	6	18	12				6

Record: 1 of 6

Feeling bookish?

Essential Database Stuff, the book I mentioned in April, is now complete and proving popular. It contains selected highlights from this column – tips, tricks, solutions and other useful material – all brought right up to date: visit **www.penguinsoft.co.uk** for more details.

The workaround solution is in the database on this month's cover disc, using a query called Par and the form, Trip. You'll also find the database at **www.pcw.co.uk/2151344**. You can move through the records in the main form, click the Run Query button and enter the trip ID. The crosstab displays the results.

MUST be moving along

In the October column I discussed upsizing from Access to SQL Server and talked about a tool called MUST (**www.upsizing.co.uk**). At that time I said it was great but pointed out a couple of limitations. Forget those, they are history; what was great is now even greater. MUST +WEB can upsize your Access database to a .Net/SQL Server solution. It is difficult to stress how useful this tool is; assuming that you need to do that conversion, it can turn weeks of work into a day of play.

Bang, shriek, pling

In the March Q&A section I wrote about the pronunciation of the ! symbol in the US. It turns out that the global pronunciation isn't as simple as I thought.

Darren Van Laar emailed to say: "I was amused to see you explaining the US terms for explanation marks. While on a computer course in the 1980s, I was taught it is pronounced 'pling' by programmers in the UK." **PCW**

Tim Anderson is an IT journalist and software developer, and began writing for PCW in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the internet.

→ Comments welcome on the Visual programming column.
Email visual@pcw.co.uk
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Powerful part of the script

How to convert your music files with Windows' new scripting environment

PowerShell is a new scripting environment for Windows. It is a free add-on for Windows XP SP2, Server 2003, Vista or Server 2008. Microsoft created PowerShell as part of a strategy for making Windows more command-line friendly, though it is unfortunate that it does not run on Server Core, the new installation option for Windows Server that has no GUI at all.

PowerShell is also an interesting language in its own right. It is based on .Net, is fully object oriented, and designed to be powerful and concise. Although it is particularly useful for administrators, it can be used for all kinds of task. PowerShell is addictive.

A core concept in PowerShell is the pipeline. This lets you pass the output from one part of a statement as input to the next part, avoiding the need for intermediate variables. For example, when investigating performance in Windows, you might run Task Manager and sort the running processes by memory or CPU usage. Here's a single-line command in PowerShell that shows the top 10 processes by memory usage, with the results shown in screen 1:

```
get-process | sort-object WS -↙
descending | select-object -↙
first 10
```

(Key: ↙ code string continues)

Note the use of the vertical bar, which is the pipe character. You can read this as a flow:
1. Get a collection of objects representing running processes.
2. Take this output and sort it into a new collection, sorted by working set (memory).
3. Take this output and select the first 10.

PowerShell is easily extended, and people have been busy posting their most useful or fun scripts. One collection is called the PowerShell Community Extensions. This includes a script, or CmdLet in PowerShell jargon, which converts text to speech. Once installed, tag the following to the end of a statement, and the output is read aloud instead of printed:

```
| out-speech
```

That could be handy for someone with failing eyesight and shows the flexibility of the tool. What follows is not a complete tutorial, but some hints to get you started, plus a sample script.

SCREEN 1

Sorting processes by memory usage

```
Windows PowerShell
PS C:\> get-process | sort-object WS -descending | select-object -first

Handles  NPM(K)    PM(K)      WS(K) VM(M)   CPU(s)     Id ProcessName
-------  ------    -----      ----- -----   ------     -- -----------
   1493     103   131008     190512   608    56.28   8164 devenv
   5095      55   102064     162872   526   129.47   5076 OUTLOOK
   1294      48   142536     144856   404   123.20   6180 iexplore
   2043      44   131684     125536   368    67.22   1200 iexplore
   1353      40    56016     111340   385   161.89   4256 WINWORD
   1105      27   113164     110736   365     9.23   4300 dexplore
    239      10    45672     107620   200   161.44   3988 dwm
   1232      39    64840      98080   318   173.50   4020 explorer
    829      15    77884      79568   162             1140 svchost
    540      19    64164      71652   230     7.56   7936 Acrobat

PS C:\> _
```

PowerShell survival guide

To install PowerShell, just download it and run setup. You will then find it on the Start menu. Think of it as an alternative to the traditional command prompt. It supports ancient Dos commands such as DIR, as well as Unix-like commands such as ls and its own more object-oriented techniques.

There is no code completion in PowerShell, so to find out what properties and methods an object supports use the get-member command. Try it on a process object:

```
get-process | select-object -↙
first 1 | get-member
```

PowerShell is annoying in that it installs by default with a restrictive execution policy, requiring all scripts to be signed. Unless this is what you want, change it to allow local scripts. To do this, run PowerShell with local administrator rights at least once. On Vista, right-click and choose Run as Administrator, then type:

```
Set-ExecutionPolicy ↙
RemoteSigned
```

This means local scripts, those you write yourself, will run without being signed. Scripts that are downloaded will not run until you unblock them: right-click, Properties, Unblock.

Creating a PowerShell profile

An easy way to customise PowerShell is through your profile. This is, in effect, a startup script for PowerShell and has a .ps1 extension. By default, the profile script does not exist. To create it, run PowerShell and type $profile. This prints the location where PowerShell thinks it should be. Copy it by selecting it, then click the right mouse button. It is likely to be in a directory called WindowsPowerShell in your Documents folder. Create the directory if necessary

```
mkdir [directoryname]
```

and then run Notepad, passing the full path and filename as an argument.

When you type scripts or other commands at the PowerShell prompt, they will not execute unless you either supply a full path, or they are on the Windows path. It's convenient to create a Scripts folder where you can place your own scripts; say, under the WindowsPowerShell directory. You can put this on the path via the profile, with the following statements:

```
#let's set our own scripts path
```

Use PowerShell to convert Flac to MP3

Flac is an excellent open-source format for storing music ripped from CDs. It is lossless, which means you get quality and flexibility. Unfortunately, Flac files are large and not compatible with Apple's iPod. Here's how you can use PowerShell to convert a batch of Flac files to MP3. Unlike some converters, this one will preserve tag information so that iTunes or other music software can index them sensibly. For this to work, you need to download flac.exe (**http://flac.sourceforge.net**) and lame.exe (**http://lame.sourceforge.net**). The Lame home page does not include a Windows binary, but you can get one from Rarewares (**rare wares.org**). Place both files in your scripts folder.

This script is in two parts. The first is a function for converting a single Flac file to MP3. The technique is to decode the Flac file to a temporary WAV, which is the format Lame accepts, then convert this to MP3. Here is the script, Flac2MP3.ps1. These are for the source and destination files:

```
param([string]$flacfile,↙
[string]$mp3file)
$tempwav =[System.IO.Path]::↙
GetTempFileName()
flac -sdf $flacfile -o $tempwav
lame -b 192 –quiet $tempwav ↙
$mp3file
rm $tempwav
```

(Key: ↙ code string continues)

This code includes a call to a standard .Net assembly, System.IO. The :: operator calls a static method. You could do this just as easily from a batch file, but the new MP3 file has no tags. PowerShell cannot read tags from Flac files; the solution is to install an additional .Net library, such as the open source TagLib#. Download it and place the file taglib-sharp.dll in your scripts folder. This additional code copies several tags from the source Flac to the destination MP3:

```
#fix the tags
[Reflection.Assembly]::LoadFile↙
("$MyPSHome\Scripts\↙
taglib-sharp.dll")

$sourcefile = ↙
[TagLib.File]::Create($flacfile)
$destfile = ↙
[TagLib.File]::Create($mp3file)

$destfile.Tag.Track = ↙
$sourcefile.Tag.Track
$destfile.Tag.Title = ↙
$sourcefile.Tag.Title
$destfile.Tag.Album = ↙
$sourcefile.Tag.Album

$destfile.Tag.Performers = ↙
$SourceFile.Tag.Performers
if ($SourceFile.tag.AlbumArtists↙
.Length -gt 0)
{
$destfile.Tag.AlbumArtists = ↙
$SourceFile.Tag.AlbumArtists
}
else
{
$destfile.Tag.AlbumArtists = ↙
$SourceFile.Tag.Performers
}

$destfile.Save()
Write-host "$mp3file created"
```

The first line of code loads the external .Net assembly into PowerShell. This means that virtually any .Net code can become a PowerShell extension. Next, the script copies the tags across using the TagLib API. The code checks for a zero-length array in AlbumArtists – note the -gt operator, which means 'greater than' – and uses the Performers tag if it is empty. A finished script would copy more tags and check for errors.

An advantage of Flac2MP3 is that you can use it in further scripts. For example, here is ConvertFLAC.ps1, which converts all the Flac files in a specified directory:

```
#convert a directory from ↙
FLAC to MP3
param([string]$sourcedir)

$thisdir = get-childitem ↙
$sourcedir -filter *.flac
$thisdir | foreach-object ↙-
process {
$rootfile = $sourcedir + "\" + ↙
[system.io.path]::getfile↙
namewithoutextension($_)
Flac2MP3 ($rootfile + ".flac") ↙
($rootfile +".mp3")
}
```

This example uses get-childitem with the –filter argument to get a collection of Flac files, then passes them one by one to Flac2MP3 using a foreach loop. You could adapt this to recurse through a series of directories, or to create the MP3 files in a different location. A single CD took three minutes on our laptop, so a large batch will take a while. However, a specialist utility called dBpowerAmp took slightly longer, suggesting there is little overhead from PowerShell – most of the time is spent crunching the data.

Fast conversion with tag preservation allows music players to see the original metadata, such as title and artist

```
$MyPSHome = Split-Path -path ↙
$profile
$env:path = $env:path + ↙
";$MyPSHome\Scripts"
```

Note the # character, which introduces a comment, and the $ character, which declares variables. PowerShell will also find any custom functions in the profile script.

Typing get-help at the PowerShell prompt gives access to the built-in documentation, but a graphical help file is more convenient. Download the PowerShell helpfile and follow the instructions for adding get-guihelp as a function in your profile. Another great idea is to install the PowerShell Community Extensions. The download location is given below.

When you install the Extensions, the setup offers to install its own profile, which may conflict with your own preferences. Uncheck this option; you can always install it later from its folder in Program Files. However, you need a minimal addition to your profile to make the extensions available:

```
Add-PSSnapin Pscx
$env:path = $env:path + ↙
";$env:PscxHome;$env: ↙
PscxHome\Scripts"
```

PowerShell resources

Home page: **www.microsoft.com/windowsserver2003/technologies/management/powershell/default.mspx**
Graphical: **www.microsoft.com/technet/scriptcenter/topics/ winpsh/pschm.mspx**
Community Extensions: **www.codeplex.com/PowerShellCX**
TagLib#: **www.taglib-sharp.com/Download/ PCW**

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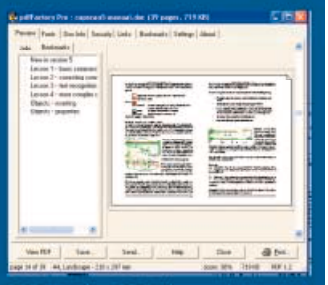

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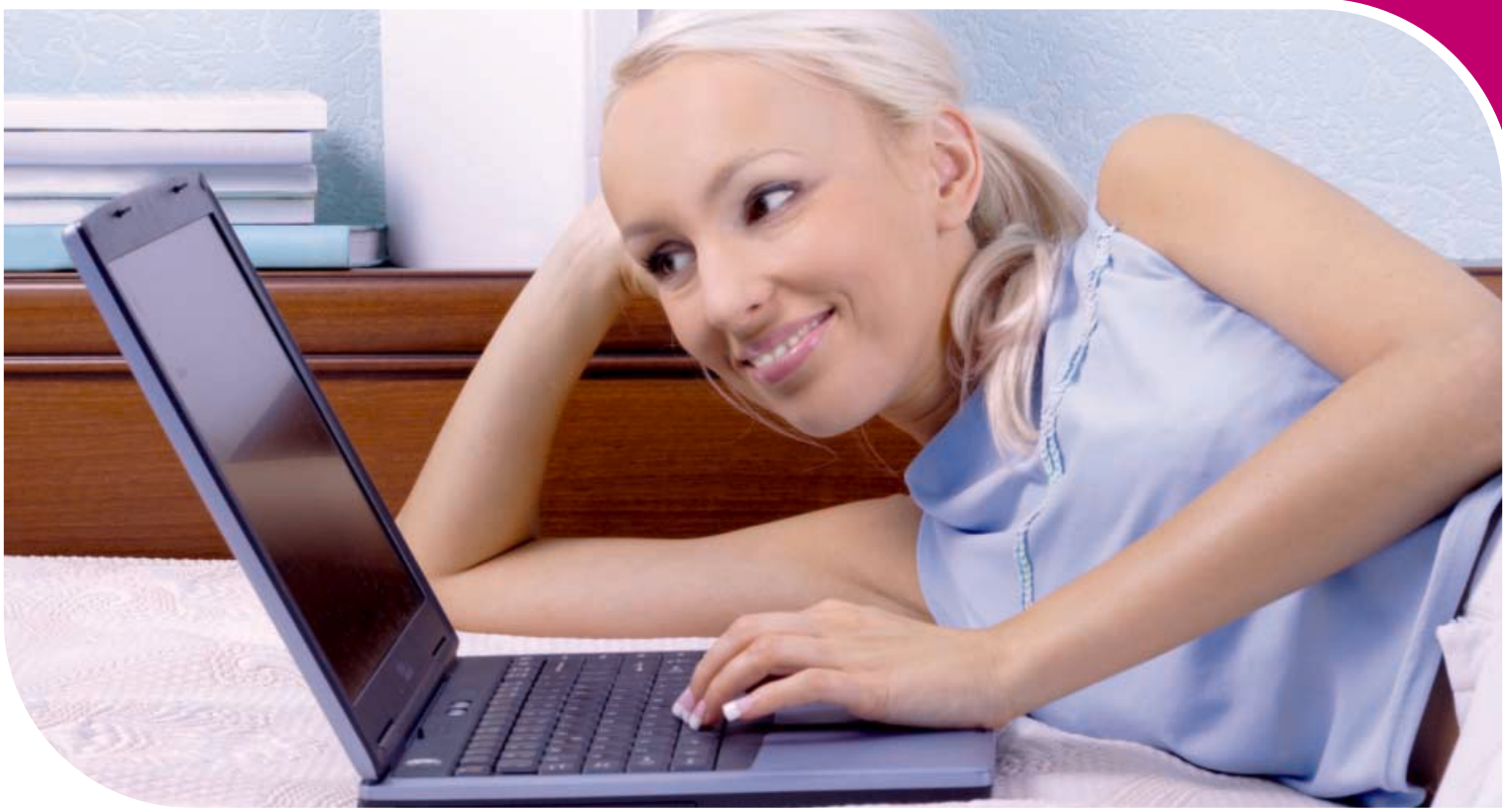

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COVER DISC

ON THE CD

Spyware Doctor with Antivirus 5.5 SE ● Magix Movie Edit 14 Silver ● East-Tec Backup 2007 ● Wise-FTP ● Likno Web Button Maker SE

ON THE 8GB DVD

Spyware Doctor with Antivirus 5.5 SE ● Magix Movie Editor 14 Silver ● Shop Factory e-Trader ● East-Tec Backup 2007 ● Wise-FTP ● Progecad Smart ● Likno Web Button Maker SE ● Linux Mint ● System Rescue CD

Let our workshops on the following pages show you how to use some of the software on the CD and DVD

SOFTWARE LISTING

ON THE CD

5 FULL VERSIONS

Magix Movie Edit 14 silver
East-Tec Backup 2007
Spyware Doctor with AV 5.5 Starter Edition
Wise-FTP 3
Likno Web Button Maker

11 TRIAL VERSIONS

ACDSee Photo Editor 2008 beta
AVG Anti-Virus 8
Blaze Media Pro 8
East-Tec Backup 2008
LP Ripper 9.02
Microsoft Expression Media 2 Beta
Notezilla 7.0.83
Spyware Doctor with Antivirus 5.5
Winoptimizer 5
Wise-FTP 5

6 FROM THE MAGAZINE

ADS Spy
DVD Slideshow
MySQL
Rijkswidget
XPSyspad
Yahoo Widget Engine

34 FREEWARE

Ace Backup 2.2
Burnaware Free Edition 1.2.9
Cobian Backup 9.0.0.121 Beta
Create Install Free 4.14
Cursor FX 2
Eusing Free Registry Cleaner 1.8
Filezilla v3 for Windows 3.0.7.1
Flashgot 0.8.3
Google Calendar Sync 0.9.3
Google Preview 3.9
Handbrake 0.9.2
HDClone Free Edition 3.5.2
IE Tab 1.5.2
Internet Explorer 8 Preview for Windows Vista
McAfee Site Advisor IE 2.6
Mini Map Sidebar Extension 0.1.4.13
Netscape 9.0.0.6
Notepad++ 4.8.2
Pictomio 1.0.2 Beta
Recuva 1.11.257
Rogue Remover 1.24
Romeo Burner Lite 2.3
Star Burn 9.8
Sugar Sync
Super Anti Spyware Free Edition 4.0.1154
System Protect 1.0
Truecrypt 5.1
Tweak Vista 1.1
Unlocker 1.8.6
Virtual Box 1.5.6
Virtual Dub 1.7.8
Virtua Win 4.0 Beta 3
Visual Task Tips 3.2
XP-Antispy 3.96-8

ON THE 8GB DVD

EVERYTHING ON THE CD PLUS...

1 FULL VERSION

Shop Factory 7 e-Trader

2 FREEWARE

Progecad 2008 Smart
VMware Player 2.0.3

2 TRIAL VERSIONS

Norton Ghost 14
Microsoft Expression Web 2.0

6 LINUX & OPEN SOURCE

Cent OS 5.1 Live CD
Foresight Linux 2.0
Free BSD 7.0
Linux Mint 4.0
Slax 6.0.1
System Rescue CD 1.0.0

120 RESOURCES

Audio, Video & Photo
Backup & Restoration
Browsers, Managers & Extensions
Burning & Media
Business & Office
Developer & Web Development Tools
General Utilities
Internet & Networking Tools
Optimisation & Diagnostics
Portable Applications
Security

HELP LINES

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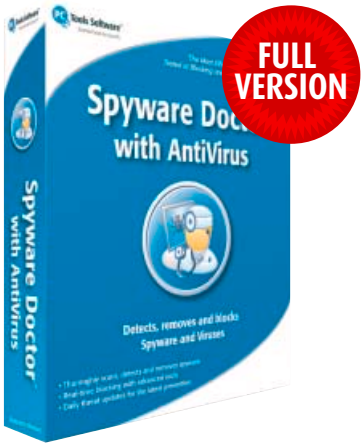
www.pcw.co.uk/disc-support

EMAIL:
help@pcwsupport.co.uk

PHONE: 01702 668 198
(9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed & 10am to 2pm Sat)

Note that we cannot give support for programs on the disc



PC Tools Spyware Doctor 5.5 SE

All-round malware protection that never expires

INFORMATION

System requirements Windows 2000 SP4/XP SP2/Vista (32-bit x86 versions only), 55MB disk space

Contact www.pctools.com

Registration Not required

Spyware Doctor has been around for years, keeping PCs safe from browser hijackers, adware and keyloggers. But now PC Tools has taken the program further with the Antivirus Starter Edition by adding a powerful anti-virus engine, ensuring it can handle any threats you might find online.

An on-demand scanning system can examine your PC. By default this will run an Intelli-scan, which allows the program to examine running applications, startup files and other locations where infections are often found. It takes only around five minutes to complete on our test PC.

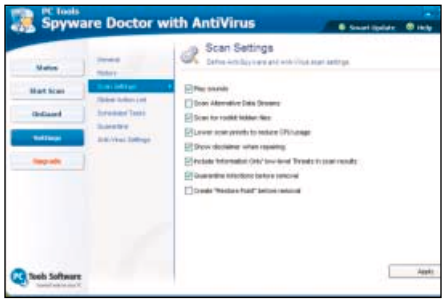
It's also possible to run the more thorough Full Scan, though, or you might choose the Custom Scan to search specific locations. These can take longer, but there's always the Scheduler, which can be set up to run scans when you're not around.

You also get real-time protection against malware through a feature called Onguard. There's a File Guard, for instance, that monitors your PC constantly and prevents any malicious files being accessed. This includes attempts to open unsafe attachments in Outlook and other email clients. The program also includes Immunizer Guard, a module that blocks known dangerous ActiveX-based threats.

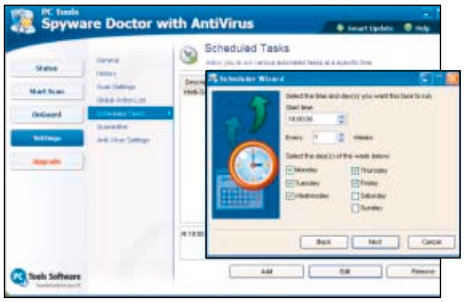
Best of all, though, is the lack of an expiry date. PC Tools Spyware Doctor with Antivirus Starter Edition isn't going to die after three months. It's entirely free for PC Tools' Smart definition updates too, so you can go on using it for as long as you need.

Configure Spyware Doctor to deliver the best possible protection

1 Install Spyware Doctor and the program will immediately start protecting your PC, no further effort required. But you'll get better results if you customise the program to suit your needs. Click Settings > General and check Run Scan on Windows Startup, say, and your PC will be quickly checked every time Windows loads, which is handy if you want to be sure this happens frequently.



2 Click Settings > Scan Settings and you'll see rootkit detection is turned off by default: it's a lengthy process and can significantly increase scan times. If you've a fast hard drive, though, or just value security above speed, then check the 'Scan for hidden rootkit files' option and see how you get on. You can always turn it off again if the program becomes too slow.



3 Of course if the scanning process really is getting in your way, it may be better to run it when you're not around. Click Settings > Scheduled Tasks and you'll find one scan has been scheduled by default, but this may not suit your needs. Click the task and select Edit to change its properties, or click Add and use the Scheduler Wizard to add a new scanning task of your own.

UPGRADE OFFER

NEW FEATURES

Block browser hijackers
Protect your Windows Hosts file
Remove tracking cookies
Block malicious hidden processes
Protect your network settings
Monitor Windows Startup programs

FULL SPYWARE DOCTOR WITH ANTIVIRUS

Move to the regular retail edition of PC Tools Spyware Doctor with Antivirus and you'll gain an extensive range of real-time protection features. Browser Guard prevents malware from changing your favourites, toolbars, add-ons and more. Network Guard stops threats from hijacking your network connection, Process Guard blocks malicious hidden processes such as rootkits, and Cookie Guard deletes tracking cookies automatically. Subscription prices start at £39.95 but, as a Starter Edition user, you can upgrade and save 30 per cent on the standard retail price. This will protect up to three PCs for a year. To upgrade go to Upgrade > Upgrade Now within the program menu.

Magix Movie Edit Pro 14 Silver

Transform tired home videos into stylish and professional movies

INFORMATION

System requirements 512MB Ram, Windows 2000/XP/Vista, 1GB hard disk space, DirectX 9.0c graphics card with 256MB Ram
Contact www.magix.net
Registration Not required
Need to know Automatic scene detection, MPEG import trim edits and some other functions of the Plus edition are not available in the Silver edition, and videos may only be exported as WMV files with a maximum resolution of 640x480pixels

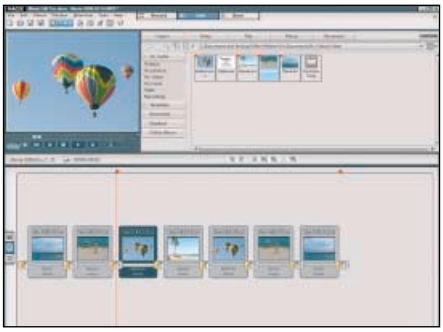
The secret to making great home movies isn't in the amount of cash you spend on the video camera or even the in-depth knowledge of film you've gained from watching all those Uwe Boll movies. The real key to producing top-quality results is to use the best possible editor, and that's why you need Magix Movie Edit Pro 14 Silver.

At its simplest you could just use the program to join a few film clips together. Find them on your hard drive, drag and drop the clips onto your hard drive, then export them as a Windows Media Video (WMV) file. It only takes a moment.

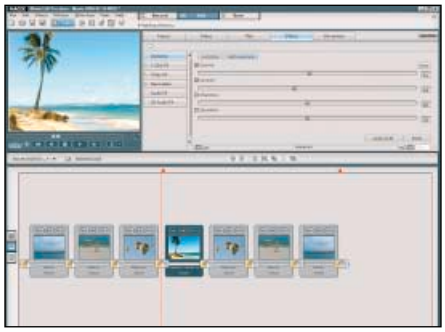
Of course the real fun starts when you begin to explore the more advanced options, and there are some surprisingly powerful features available. Click the Movement tab, then choose the Rotation function, for instance, and you'll be able to tweak the current clip's size and position, as well as rotate it to whatever angle you choose. There's a 3D morph option to spin and mirror the picture, while a Level Horizon feature compensates for those times when the camera wasn't quite as straight as it should have been.

And if your original camera work seems too static, it's easy to compensate with a range of useful video effects. You can zoom in or out, pan left or right, or choose more complex effects simply by double-clicking on the option of your choice from the Effects Gallery. Play around to see what's on offer, then add professional fades, your own titles, and when you're ready, export the results and share them with others.

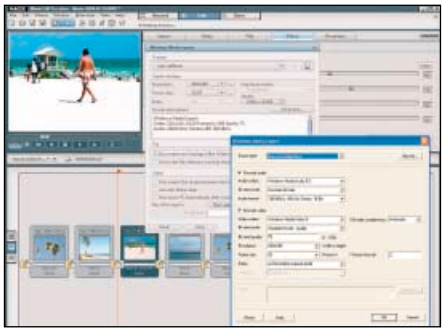
Build stylish, professional movies at speed, no experience required



1 Launch the program, choose to Create a New Movie, and select the Edit button at the top of the screen. Click My Media and browse to the folder containing the clip or clips you want in the movie (MPEG isn't supported in this version). Choose the files and then drag them onto the video timeline. You can rearrange their order, if necessary.



2 Click Play to get a preview for how your movie looks so far. If you have any problems, click the Effects tab for solutions. Choose the Optimize tab for tools to fix colour balance, exposure or softness issues. Click Autocolor or Auto exposure, then click the Auto button to adjust the image, then use the sliders to make any final picture tweaks.



3 Explore the tabs for ways to add fades, titles, video effects and more to your video, again using the preview window to check it's going well. When your movie is done, click File > Export Movie > Windows Media Export to save it as a WMV file, and don't miss the advanced options: they provide complete control over the whole encoding process.

UGRADE OFFER

NEW FEATURES

Watch and record TV
Full HD video support
Automatic soundtrack creation
Record streaming videos
Upload straight to Youtube
Write to MPEG, DVD, Blu-ray

MAGIX MOVIE EDIT PRO 14 PLUS

Move to Magix Movie Edit Pro 14 Plus and you'll be able to import HD videos, create Dolby Digital surround sounds, and apply special effects such as 3D scrolling text and professional picture-in-picture animations. The results may then be exported as video files, burned to DVD, mini DVD or Blu-ray discs, even uploaded directly to Youtube.

But the real fun comes with all the extras: TV recording and playback (if you have a tuner), the ability to capture streaming video, a powerful 3D-animation tool, and more.

It's all yours for only £59.99 plus £2.99 shipping, and you can click Help > Upgrade to Full Version > Upgrade for the full details.

East-Tec Backup 2007

Keep your valuable data safe from harm with this backup tool

INFORMATION

System requirements Windows 98/ME/2000/XP/Vista, 8MB disk space

Contact www.east-tec.com

Registration Point a browser at www.east-tec.com/vnufree for instructions on obtaining your licence key

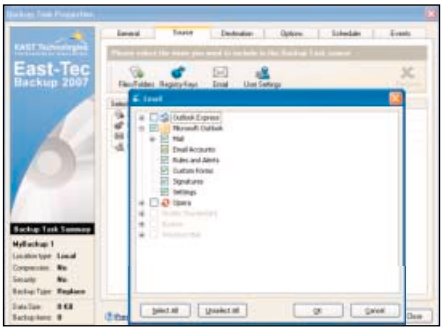
Running backups will always be a tedious process. But the pain can be kept to a minimum with the right backup software, and there are few better choices than East-Tec Backup 2007.

The program provides a standard tree-type view to specify the folders you'd like to back up. You could also ask it to search for and save particular file types (videos, music or productivity files), no matter where they are on your hard drive. It can save Registry settings or your emails in a couple of clicks. And the User Settings dialogue allows you to preserve the settings for common applications (audio players, instant messengers, browsers) by checking a few boxes.

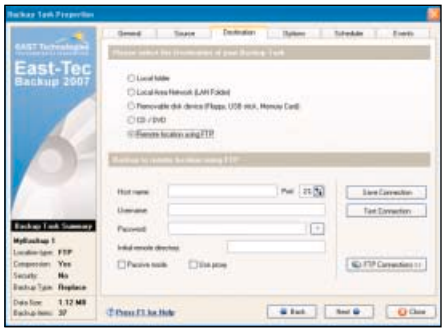
The flexibility continues when you get to decide your backup destination. You're able to save files to a local folder, network drive, removable disc, CD/DVD, even a remote FTP connection. And the program can work with incremental, differential and stacked backups (the latter creates multiple copies of changed files with version numbers), so you're sure to find an option that works for you.

There's not just the ability to compress your files: you can also create self-extracting archives, or split the archives into files of a defined size. Encryption comes in both ZIP password and AES forms. The scheduler has just about as many configuration options as you'll have ever seen. And once the backup is complete, the program can do anything from play sounds, to send emails or run the program of your choice. It doesn't get much more versatile than this.

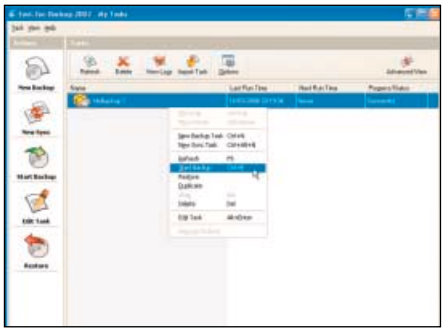
Create a useful backup job that runs in less than 5 minutes



1 Backups don't have to take forever. Even a quick backup across the network can still be useful. Launch East-Tec Backup 2007, click Create a new Backup Task, select the Source tab and click Email. Check the box next to any email client that you use and the program will save your emails, rules, signatures, settings and more. Click OK.



2 Click the Destination tab to choose where your data will be saved. This could just be a local folder, but if the hard drive fails you'll lose the backup, too. You're better off choosing a network folder, say. Or, if you've access to an FTP server, select 'Remote location': that way your data will survive even major disasters like flood or fires.



3 Click the Options tab and select Use Zip Compression. Then click Events > Finish and you're done. Click Yes to run the Backup Task, the backup job will be run as you've defined, then you'll see the results in the My Tasks window. Here you may run the job again, edit it or create a new one, and don't miss the Options dialogue for some handy configuration settings.

UPGRADE OFFER

NEW FEATURES

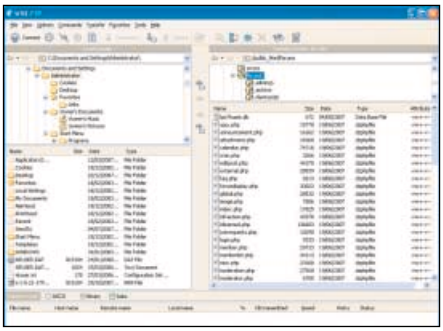
Create compressed archives
Incremental/different support for CD/DVD
Span archives over multiple hard drives
Enhanced reporting capabilities
Free updates for two years

MORE POWER IN EAST-TEC BACKUP 2008

The latest version of East-Tec Backup improves the program with ZIP64 support, letting you create compressed archives greater than 4GB. There's support for incremental and differential backups to CD and DVD, archives can be spanned across multiple hard drives, and you'll get enhanced reporting tools. It's a supremely professional tool, yet comes at the decidedly low-end price of only £7.50. Or you can buy licences to cover two PCs for a mere £15. It's a real backup bargain, and you can upgrade directly from the author's web site at **www.east-tec.com/vnuoffer**.

Wise-FTP 3

FULL VERSION



It's easy to synchronise remote and local folders with Wise-FTP

INFORMATION

System requirements Windows ME/2000/XP/Vista, 4MB disk space
Contact www.wise-ftp.com
Registration Not required

FTP clients don't exactly make headlines any more, but they're still essential applications for just about everyone who needs to manage a website, and Wise-FTP is one of the best.

The program makes it easy to enter all the details of your FTP connection: host name, login details, connection type, proxy settings and more. You can enter the details for as many sites as you need via the built-in Site Manager, then organise them with your own folder structure.

Once connected, Wise-FTP has one pane for showing your hard drive, and another for the remote FTP server. File transfer is easy, just drag and drop the files from one pane to the other.

The program has lots of features to speed up your FTP operations. If you want to make a quick edit to a PHP file, you might normally download it to your hard drive, open the document, save it your hard drive and upload the file again. But here you can select a file, choose to open it with the internal Wise-FTP editor, and make changes right away.

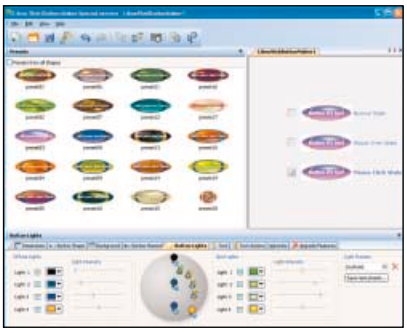
You can also synchronise local and remote folders, where Wise-FTP will automatically ensure the files on your server match those on your hard drive. Or, if you're working with a lot of files, set up the Scheduler and it'll upload them all while you're not around.

UPGRADE OFFER
UPGRADE TO WISE-FTP 5

The latest incarnation of Wise-FTP delivers powerful features such as integrated compression, file previews, scheduled FTP transfers, FTP site backup and restore, direct FTP server to FTP server transfers, support for files larger than 2GB, FTPS support, improved HTML editing, and a whole lot more. And yet the upgrade from version 3 will still only cost £10, which sounds like an extremely good deal to us. Browse the full feature list and then place your order at **www.wise-ftp.com/order.htm**.

Likno Web Button Maker SE

FULL VERSION



Select the button style you need from an entire library of attractive options

INFORMATION

System requirements Windows 98/ME/2000/XP, 20MB disk space
Contact www.likno.com
Registration Launch Likno Web Button Maker and click 'Activate for free'

Trying to get the right buttons for your website can be frustrating. Especially after you've spent hours trying to create them manually with a graphics editor, or browsing through a host of online libraries, none of which deliver quite what you need. Fortunately, Likno Web Button Maker makes the whole button design process as simple as it's likely to get.

Launch the program and you'll immediately be presented with an oval button. It has a realistic wood-like texture, while a light reflects off the left-hand side, and white text hovers above. If you like this, double-click the button, enter your own text, and export the results in JPEG, GIF or PNG formats.

If you'd like to see what else the program has on offer browse the Presets window for a range of colour schemes. Double-click any that appeals, then click the tabs below for more options. You're able to change the button shape, try a different material, tweak the lighting and customise the reflection. There's also control over the button text, including 3D rotations.

You can customise your creation further by switching to a three-state button: this displays a normal, mouse-over and mouse-click image, each of which may be tweaked to suit your needs. And if you add links to a button the Export option will display a sample HTML page, explaining how they can be used on the web.

UPGRADE OFFER
SAVE 20% ON BUTTON MAKER STANDARD

Move to the standard version of Likno Web Button Maker and you'll gain a lot, including 26 eye-catching button shapes, 35 stylish, attractive textures, and a pack of 100 ready-to-use buttons. Each button can have a shadow, and allows multi-line text for extra flexibility. It's a big step forward, yet the upgrade still only costs around £14, a 20 per cent discount off the usual price. Click Help > Upgrade Likno Web Button Maker to find out more.

↘

ON OUR COVER DVD

Shop Factory V7 eTrader

Launch a professional online shop with this feature-packed tool

INFORMATION

System requirements Windows 98/2000/XP/Vista, 100MB disk space
Contact www.makemeashop.com
Registration Register online at **www.makemeashop.com/covermounts/vnu/**
Need to know This version of Shop Factory limits your store to a total of 15 products and 25 pages

Internet shops are the fastest growing area of retail right now, and there's never been a better time to dip your toes in the waters of ecommerce. This can seem an intimidating prospect, especially if you know nothing about web design, scripting, shopping carts, or any of the other essential elements of online stores. But that doesn't have to be a problem. Shop Factory V7 eTrader will walk you through just about every step involved in creating and managing your shop.

The program comes with a range of attractive site templates that ensure your site will look every bit as professional as the commercial competition. The template also includes default sections where you can enter your privacy policy, terms of trade, contact details and more – handy if you're a beginner and might otherwise not realise that you need a privacy policy at all.

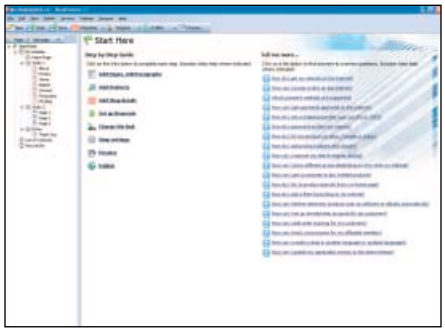
You'll want to enter product details at some point, and that's easy too. One dialogue lets you enter a variety of short or detailed descriptions, as well as entering thumbnail and full-sized images; everything you need to attract the attention of potential customers.

There are lots of business issues to consider, too: shipping, taxes, currencies, payment methods and more, but they're all covered in the Help file and a selection of wizards.

A Preview button lets you view the site at any time, in your default browser. If everything's right, you can publish the page to your own site, or pay to use the author's own hosting service, and your shop could be online within minutes.

Build your first web store in less than a day

1 Launch Shop Factory, click 'Create a new Website' and give your project a name. Then click Next to see your choice of themes, the layout and colour scheme that you'd like your shop to use. Don't worry if none of these are quite right, you can customise everything later, just choose the theme that best suits your needs and click OK to generate your site.



2 The Shop Factory authors understand that building a web store can seem intimidating, so they've built plenty of help and advice into the program. Click 'Start here' and you'll find helpful answers to common questions, as well as a step-by-step guide to creating your store. The latter is available in an easy to access pop-up window, too (click Help > Popup Help).

3 But if you avoid Help files and prefer to jump right in, start clicking on the Index 1 pages (About, Contact etc) and filling in the details for your store. Next select Page 1, enter a general introduction for your products, and click 'Add product' to begin adding your products. Use the Preview option frequently and you'll have a good feel for how the site will look online.

UPGRADE OFFER

NEW FEATURES

Add unlimited products
More professionally designed themes
Discount and gift vouchers
Supports unlimited pages
PPH search with Ajax powered results
Real-time stock control

SWITCH TO SHOP FACTORY PRO

Shop Factory V7 eTrader limits you to stores containing a maximum of 15 products and 25 pages. Upgrade to Shop Factory Pro and you'll remove this limitation, though, as well as gaining new shop themes and a range of other useful features, all for around £305. Or if you're really serious about ecommerce, try the £610 Gold version, which adds more features for promotions, stock control, sales analysis and more. Visit the Shop Factory site (**www.makemeashop.com**) for in-depth details on everything the two packages have to offer.

COMPETITION

WIN! Archos products worth £1,140!

You can enjoy all your multimedia content in your living room or on the move with the revolutionary Archos TV+ and the Archos 605 Wifi Personal Media Player. This month, three lucky winners will win the 30GB Archos 605 and the 80GB TV+, which synchronise seamlessly to deliver media content at home or on the go.

The Archos 605 Wifi is a top-of-the-range portable video player that allows you to carry around your favourite music, movies, photos and TV shows as well as giving you mobile access to the internet. The sleek MP4 player has a beautiful 4.3in touchscreen providing high-resolution screen quality. The 30GB model can hold as many as 40 movies, 20,000 songs or almost 400,000 photos, so there will be enough on your Archos to entertain you for hours.

The Archos TV+ home Wifi entertainment centre bridges the gap between the PC and television. You can stream content from the PC, your portable Archos media player, or the internet to the television – all through a Wifi or Ethernet home network. You can also download movies from the Archos Content Portal, watch online videos and access other entertainment.

Connect your 605 to the USB port of your TV+ and enjoy all the content stored on it through your television.

The Archos TV+ makes recording content easy with the electronic programming guide that schedules recording up to a week in advance. Once set up, Archos TV+ will communicate with your set-top-box to record a programme. This will then be stored on your Archos TV+ memory, which comes in 80GB and 250GB sizes. Roughly 450 hours of video can be stored on the 250GB device, but it can also be used to hold music, movies and photos, all of which can be accessed through your TV. For more information on Archos, head to **www.archos.com**.

For your chance to win one of these great prizes, answer the question below and enter online at **www.pcw.co.uk/competitions**. The competition opens on 17 April 2008 and closes on 16 May 2008.

How many movies can the 30GB Archos 605 Wifi PMP hold?
a) 5
b) 10
c) 40

This competition is open to readers of *PCW*, except for employees (and their families) of Incisive Media, and Archos. PCW is the sole judge of the competition and the Editor's choice is final. Offer applies to residents of the UK and the Irish Republic only. Entrants must be over the age of 18 and only one entry per household will be accepted. Winners will be selected at random from all correct entries received. No cash alternative is available in lieu of prizes. Incisive Media will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competition. Incisive Media reserves the right to substitute the prize for one of greater or equal value if circumstances make this unavoidable. Prizes will be dispatched by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competition. Incisive Media will use all reasonable efforts to ensure that the prizes are as described on this page. However, Incisive Media cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

The winner of the March competition is John Bowler, who wins an Alienware gaming PC.

ENTER ONLINE AT www.pcw.co.uk/competitions

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On the web

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PCW is not just a great monthly magazine, we also have a website carrying daily news, reviews, features, downloads, competitions and blogs written by us and our sister titles. The website is updated daily, to help keep you abreast of the latest events and new products.

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Our labs blog, the Test Bed, gives you regular updates on the latest gossip, technology trends and products.

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You may recognise some entries in this blog from our Letters pages, but they are published here first, letting you add your views and comments.

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If you want to keep up with the latest news, reviews, blogs, Hands On and software downloads, then sign up for our weekly *PCW* email newsletter. It is published every Friday and gives you a selection of the highlights from the week. Our Products newsletter goes out on Wednesdays and includes the most important news stories and reviews.

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10 tips for buying safely

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£1,299 Mega PCs

Notebooks might be the rising stars, but you still can't beat a good old desktop PC for the ultimate performance and upgradeability. We challenge the major manufacturers to come up with powerhouse PCs for less than £1,300.

Is it TV, or is it the internet?

There's no shortage of video content available online – BBC iPlayer, Youtube and 4OD are all popular examples – but the technology is surrounded by confusion. We take a look behind the scenes and explain exactly what the fuss is all about.

Build a budget PC

If you thought that building your own PC was expensive, think again. With low-cost components available online, it's possible to build a new PC base unit from scratch for almost pocket-money prices. Our complete guide shows you what to look for and how to save a stack of money along the way.

All about hard drives

You entrust them to look after your documents, photos and other important files, but just how do hard drives work and what's inside them? We take a closer look at this often overlooked technology and tell you everything you need to know but were afraid to ask.

There's lots more in July's PCW
DON'T MISS IT...

JUNE 2003

From the archives: Take a look at the important events in technology five, 15 and 25 years ago.

Digital cameras are ten a penny today, but in 2003 the revolution was just starting, with digital camera sales accounting for 51 per cent of all cameras sold.

We tested 10 digital cameras, ranging in price from £129.99 to £300, with drastically varying image quality. The slim Casio Exilim EX-S2 produced compression artefacts and on its closest possible macro setting still had to be at least 1m away from the subject matter. The Ricoh Caplio G3, on the other hand, could focus on objects just 1cm away. Canon's Power Shot A70 took our top honours for decent image quality, versatile menus and plenty of auto settings.

The first working fuel cells for laptops were launched at Cebit 2003. These batteries used 125ml cartridges of methanol to deliver 120 watt-hours of energy, enough for a frugal notebook to run for 10 hours, and when you needed to recharge, you simply replace the methanol cartridge. The downside was they weighed 1.1kg and added significant bulk to any notebook.

Toshiba and Smart Fuel Cell (SFC) each had their own designs and SFC said size was being reduced by 20 per cent a year. Fuel cells aren't quite ready for consumer electronics yet but SFC is selling them for caravanning, yachting and military purposes today.

JUNE 1983

How much would you pay for a word processor? In 1983 £1,000 was considered a fair bargain. For that you could expect to get your hands on a Vic-20 computer, a daisy-wheel typewriter with the ability to mimic a dedicated printer, an 80-column display (resolution was irrelevant back then) and a copy of Quick Brown Fox, the cutely named rival to Wordstar and Wordpro. It's a wonder anyone could ever afford to get into computing at those prices.

Fortunately, though, they did, or they'd not have had a use for the £1,136 ESW 3000 printer from Olympia which, its inventors proudly proclaimed, moved at an "eye-blurring" one line every two seconds. Modern laser printers can spit out a whole page in that time. Neither would they have had a reason to buy *PCW*'s first sister publication, *Personal Computer Games*, which launched in 1983 and continued for a couple of years. Promising to help its readers "start winning, winning, winning", it cost a fairly steep £1 when *PCW* was a mere 85p.

JUNE 1993

Leaping straight to the middle of the June 1993 issue we had a group test covering hard drive controller cards using either ISA or EISA interfaces. Prices ranged considerably from £127 to £1,200 and the four cheapest cards in the group were all made by Promise – the only brand we still recognise today.

We also ran an extensive preview of the OS/2 v2.1 update of the unsuccessful OS/2 v2.0, which didn't really change OS/2's eventual fate. We dedicated a four-page review to Adobe Photoshop v2.5 and loved it. It is noteworthy that the price was £725, so, by any metric, Photoshop is significantly cheaper today.

The Sharp IQ-9000 personal organiser was far cheaper at £349, and it had a Qwerty keyboard, a touch-sensitive screen plus infra-red to link to a printer. It only had 256KB of memory and a 256KB expansion card cost £129.99.

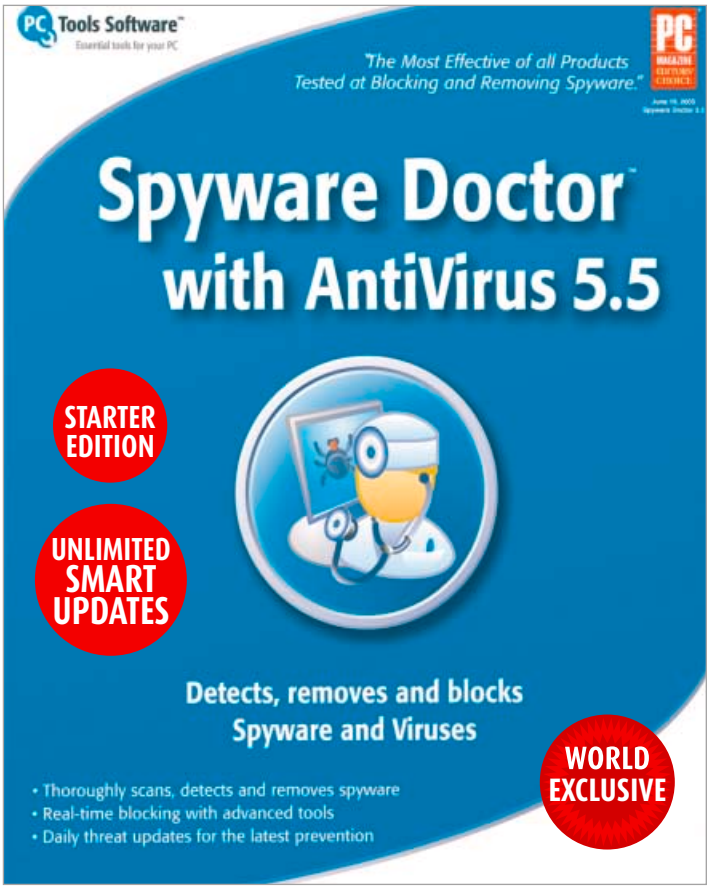
Finally, we looked at Microsoft Works 3.0, supplied on five floppy disks, which we welcomed as well as a valid alternative to more the bloated office suites.

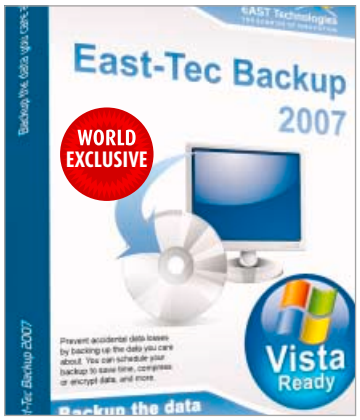
COVER DISC

JUNE 2008

Personal Computer World

THIS MONTH'S GREAT SOFTWARE COLLECTION





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